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The role of the Hudson Institute in the policy research center program was to build on and adapt current studies of the future for the purpose of assisting the Office of Education and its five pilot centers. Part 1 of this report comments briefly on some methodological and substantive issues that arose during the pilot phase and suggests how portions of the work might be continued. Parts 2-9 are papers that summarize some of the background studies. The authors and their papers are (1) Raymond D. Gastil, "Problems in Demographic Projection for Educational Policy Planning," (2) Raymond D. Gastil, "Education and Anti-Poverty Measures," (3) John Karlik, "Implications of Long-Range Economic Prospects for U.S. Education," (4) Mark Wehle, "Notes on World-Wide School Enrollment and Illiteracy to the Year 2000," (5) Richard Brown, "A Role for Higher Education in Post-Industrial Society," (6) Lottie E. Mackay, "Drugs to Improve Memory and Learning," (7) Anthony J. Wiener and Herman Kahn, "Faustian Powers and Human Choices: New Issues for the Educational System," and (8) Andrew G. Caranfil, "World-Wide Aspects of the Student Movement: A Preliminary Report on a Continuing Study of Student Movements." (HW)

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POLICY RESEARCH CENTER PROGRAM

FINAL REPORT TO THE
U.S. OFFICE OF EDUCATION
BUREAU OF RESEARCH

JUNE 28, 1968

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HUDSON INSTITUTE
CROTON-ON-HUDSON, NEW YORK

ANCILLARY PILOT STUDY FOR THE EDUCATIONAL POLICY RESEARCH CENTER PROGRAM

A Final Report
to the
Bureau of Research
Office of Education
Department of Health,
Education and Welfare

Contract No. OEC-1-7-071005-4252

HI-1043-RR

June 28, 1968

Herman Kahn, Project Leader
Anthony J. Wiener, Deputy Project Leader

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OFFICE OF EDUCATION

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ANCILLARY PILOT STUDY FOR THE EDUCATIONAL POLICY RESEARCH CENTER PROGRAM

TABLE OF CONTENTS

Page

PART ONE: EDUCATIONAL POLICY STUDIES: OVERVIEW OF THE PILOT PHASE. 1-1

PART TWO: PROBLEMS IN DEMOGRAPHIC PROJECTION FOR EDUCATIONAL POLICY PLANNING (by Raymond D. Gastil) 2-1

PART THREE: EDUCATION AND ANTI-POVERTY MEASURES (by Raymond D. Gastil). 3-1

PART FOUR: IMPLICATIONS OF LONG-RANGE ECONOMIC PROSPECTS FOR U.S. EDUCATION (by John Karlik). 4-1

PART FIVE: NOTES ON WORLD-WIDE SCHOOL ENROLLMENT AND ILLITERACY TO THE YEAR 2000 (by Mark Wehle) (With notes on U.S. graduates prepared by Laurie C. Rockett) 5-1

PART SIX: A ROLE FOR HIGHER EDUCATION IN POST-INDUSTRIAL SOCIETY (by Richard Brown) 6-1

PART SEVEN: DRUGS TO IMPROVE MEMORY AND LEARNING (by Lottie E. Mackay). 7-1

PART EIGHT: FAUSTIAN POWERS AND HUMAN CHOICES: NEW ISSUES FOR THE EDUCATIONAL SYSTEM (by Anthony J. Wiener and Herman Kahn) 8-1

PART NINE: WORLD-WIDE ASPECTS OF THE STUDENT MOVEMENT: A Preliminary Report on a Continuing Study of Student Movements (by Andrew G. Caranfil). 9-1

PART ONE

EDUCATIONAL POLICY STUDIES: OVERVIEW OF THE PILOT PHASE

TABLE OF CONTENTS

Page

A. The Role of Hudson Institute in the Policy Research Center Program 1-1

B. Proposal for the Continuation of Hudson Institute's Ancillary Role 1-3

C. Comments on Policy Research for Education. 1-12

1. Lead-Time 1-12

2. Need for Shared Ideas 1-13

3. Special Educational Needs for Decision-Makers 1-14

4. New Skills Needed in the Post-Industrial Society. 1-17

5. Expectations and Policy Decisions 1-18

6. The Standard World and Variations 1-26

a. More integrated, stability-oriented 1-27
b. More integrated, development-oriented 1-27
c. More inward-looking, with an eroded communist movement. 1-28
d. With eroded democratic morale and some communist dynamism. 1-28
e. With a dynamic Europe and/or Japan. 1-28
f. Greater disarray, with an eroded communist movement . 1-29

7. Introduction to the Mosaic Society. 1-29

8. Regional Variations 1-31

D. Conclusion 1-32

A. The Role of Hudson Institute in the Policy Research Center Program

Hudson Institute was not in competition with the five pilot centers which were candidates to become operational policy research centers, but was to render ancillary services to the five pilot centers and to the Office of Education. Specifically, we were called upon to build on and adapt our current studies of the future for this purpose, describing alternative futures and trends both for education and for aspects of society and technology impinging upon and relating to education policy. We summarized much of our previous work on the future in The Year 2000: A Framework for Speculation on the Next Thirty-Three Years by Herman Kahn and Anthony J. Wiener (New York: Macmillan, 1967), which was published during the period of this report. Copies were distributed to members of the pilot centers, the Office of Education, and the review committee.

A seminar was held September 26-29, 1967, attended by members of the Bureau of Research, members of the pilot policy research centers, and members of the review committee. The seminar was intended to help those responsible for establishing the operational centers in initiating the research program under the centers, as well as those responsible for overseeing and using the work of these centers. It was also used to introduce proposed concepts of policy research and educational futures to potential staff members, consultants and other contributors to the operational centers. A second seminar was held January 8, 9, and 10 in San Francisco. At this meeting, there were further presentations of Hudson Institute work on future contexts for educational policy, and an opportunity for all participants in the policy research center program to discuss, to formulate collaboratively, and to crystallize their plans for further participation in the operational centers, in the light of the Bureau of Research's decisions.

In order to give a sense of the importance of the seminars in the Hudson program for the Office of Education, it is worth noting that direct costs associated with these two seminars (expenses of all guest participants other than travel, direct staff time, briefing notes, etc., not including research time for preparation of material presented or discussed in the seminars) amounted to about one-half of the $50,000 granted by the Bureau of Research to Hudson Institute for this pilot study, leaving only about $25,000 for the preparation of the seminars and the preparation of background papers such as those included in this report.

The purpose of Part I of this final report is to comment briefly on some methodological and substantive issues that have struck us, during this pilot phase, as worth pointing out once more, to suggest how portions of this work might be continued, and to add some brief speculative notes that have to go somewhere. The following sections summarize some of our background studies that were intended to serve such substantive purposes as context, guidance and stimulation for other studies in the program, as well as to provide bases for continuing work by Hudson Institute staff members. There were some additional studies (mentioned in the progress report under "Work in Progress") that were not ready for distribution at this time. Some of these have been discontinued, at least temporarily, while work is continuing under other auspices on others. The papers by Wehle, Karlik and Gastil in this report are probably final in their current form, but some of the other papers in this report will be expanded and revised as part of a new Hudson Institute project on "Issues Before the Next Administration."

B. Proposal for the Continuation of Hudson Institute's Ancillary Role

Education is centrally related to much current and proposed Hudson Institute research, particularly our development of teaching techniques for the education of policy-makers, as in our current Analytic Summary Project (described below). In addition, our ongoing studies of alternative world futures, technological prospects, socio-political change, the future of poverty, race relations, economic development, urban problems, and long-range planning for national science policy and federal budget priority allocations, are closely interconnected with issues that affect the study of future educational policy. Therefore Hudson would be strongly interested in a continuing role in educational policy research in addition to its continuing relation with both the operational centers.*

We believe this role can best be carried out under a separate contract with the Office of Education, which would provide for a subcontract from Hudson Institute to the Syracuse EPRC, and/or to other sources of specific expertise in educational policy. (The general terms of this arrangement have been agreed upon by those concerned.) If funding at an optimum level is not available in Fiscal 1969, we believe it would nevertheless be extremely valuable if a small project were supported, designed to explore and prepare for future activities.

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*We have a subcontract from the Syracuse EPRC providing for consulting services in the setting up of their program and aid in the design and construction of an instructional program for participants in the educational system. In addition, Anthony J. Wiener has agreed to serve as a consultant to the Stanford EPRC for several weeks during their first year.

This direct relationship to the Bureau of Research would be especially useful for the purpose of preparing and delivering a course on future educational policy. The objectives of the course would be:

1. To present a consideration of alternative educational strategies for various situations and levels of analysis, as part of the process of teaching the use of deliberate alternatives in policy-making;
2. To acquaint educational policy-makers with the desirability and techniques of comparing alternative strategies or programs in the process of decision-making. This might be thought of as a process of teaching "qualitative" systems analysis, as it would be applied to only partly quantifiable areas, such as education;
3. To present to academic policy-makers information and concepts of alternative world futures in order to improve their knowledge and understanding of long-term prospects relevant to education.

The course would, through the collaboration of the EPRC's, and through direct involvement of all participants, also serve functions such as the following:

1. Contribute to the construction of paradigms for educational policy researchers. By "paradigm," we mean something much less formal than an analytical model in the mathematical sense, but more elaborate than a metaphor and more structured than a framework.* The paradigms we will seek to construct will be based on

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*Robert K. Merton has demonstrated the value of paradigms for sociological analysis in his Social Theory and Social Structure (Glencoe, Ill.: Free Press, rev. ed. 1956), and the points he makes apply equally to the analysis of problems of pulbic policy. (See The Year 2000, pp. 403-405.)

provisional efforts to integrate the relevant insights of a number of disciplines. While we would hope to maintain scholarly standards of rigor, thoroughness, and depth, these standards must not be so rigid as to defeat our primary purposes of synthesis and stimulation--thus unfortunately the integration will occasionally but necessarily be relatively intuitive or subjective--even if this dependence on intuition or subjectivity is explicated. In any case, explicit insights, concepts, metaphors, and paradigms, even if tentative and incomplete, seem preferable to unstated, inexplicit assumptions.

2. Contribute, in part as a by-product of its general program of work on the future, a broader and deeper perception of future technology, including the study of technologies not obviously related to education,* than the operational centers would be likely to be able to maintain.
3. Furnish, through its general program of work in international relations and foreign and military prospects, as well as its general program of projections on U.S. economic and social prospects, a rich source of alternative possibilities for international and domestic social change which could impinge upon the educational system,

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*There is no need, we think, to point out the usefulness of teaching future technology. The faster people understand these issues and can cope with them in various ways, the faster they introduce and use the changes (which, we agree, has its negative aspects, but on the whole is a positive trend). More important, the social problems associated with new trends become much clearer--and because of planned flexibility, the ability to muddle through increases enormously.

4. Serve the operational centers as consultants on their studies and help them avoid parochialism or inbreeding, sharpen the relevance of their studies to policy decisions and enhance the likelihood of utilization, bring in important ideas from seemingly unrelated as well as obviously related fields and provide stimulation and enrichment in a number of ways, on the basis of broad and continuing experience with future studies, policy research, and consultation on policy implementation in a wide range of fields.

One of the products of the course would be a set of materials designed for the use of other institutions, who could hold similar courses or incorporate portions of our course into a regular academic curriculum. The development and presentation of this course should be planned over a five-year period. One of its uses would be to reach large numbers of people influential at one or another level of the educational system who in turn can impart the benefits of the course to others. The course should become a major agent of change in the U.S. educational system. Initial versions would probably be designed for five-day presentations to groups of 30 or 40 selected participants. The course would evolve each time it was presented. Later, longer and more intensive courses would be developed as well as shorter sessions intended for very large groups. A subsidiary course might deal with alternative futures for education. The presentation would be organized around issues relevant to educational policy-makers, and designed to serve two purposes. The first is to stimulate the audience and provide information and ideas useful to them in their work in education. This would be presumably the major attraction for its potential audience, but the presentation would serve a secondary purpose of introducing the idea of a deliberate and systematic examination of alternatives for the purpose of policy formulation and decision.

This course would focus attention upon the value-issues raised by policy choices in education, as a step toward the formulation of a teaching device: "alternative basic educational policies." (A paper discussing an analogous topic, "Notes Toward the Choice of a Basic National Security Policy," was distributed at the September seminar.) This formulation--a systematic comparison of groups of basic themes, values, and emphases affecting basic foreign and military policies--has been found an effective teaching tool in the regular Hudson Institute seminar-course. For example, it might be useful to distinguish, in any formulation of educational policy, among the following "levels of analysis":

1. Societal values and contexts
2. Educational objectives
3. Educational theories and strategies
4. Educational techniques and tactics
5. Administrative implementation
6. Educational resources, capabilities, and constraints
7. Societal resources, capabilities, and constraints

Next, one might consider, in terms of the above hierarchy of considerations, the kinds of roles educational systems may play. For example, they may be used to:

1. Further social, political and cultural ends: skills, knowledge, habits, styles, attitudes, and values
2. Do same for vocational ends

3. Encourage, cultivate, or satisfy various individual desires, talents, or needs
4. Evaluate, certify, and select for various individual, educational, vocational, governmental, and other purposes
5. Further mental and physical health
6. Provide different kinds of custodial care, entertainment, social opportunities, social status, or in loco-parentis roles
7. Display skill, concern, wealth, modernity, etc., of parents or community and political leaders
8. Provide economic and prestigious opportunities

In achieving these purposes, a large range of "values," such as the following, may be involved, either as ends-in-themselves or as subsidiary norms:

1. Respect and recognition (competitive and mutual)
2. Wealth (access to commercially available resources)
3. Physical well-being (safety, health & comfort)
4. Physical power (over things--territoriality?)
5. Political power (over people & community decisions)
6. Change, stability and/or continuity
7. Rectitude, duty and responsibility (fulfilling ethical, moral and/or religious imperatives)
8. Achievement (gaining and using skills, meeting challenges)
9. Play, spontaneity & self-expression (being oneself?)
10. Enlightenment and understanding
11. Friendship, companionship, affection & love (to give and/or to receive)
12. Spiritual, mystical, & religious experiences, codes and/or fulfillment
13. Adventure, excitement, danger
14. Loyalty to or submergence in familial (shared fate, common commitment, ego-identification) structures

15. Sensual satisfaction (food, sex, music, art, aesthetic and pleasant surroundings and experiences)
16. Egoistic immortality (recognition)
17. "Perversions" (masochistic, sadistic, nihilistic, etc.)
18. Praise, reassurance, attention, etc.
19. Satisfaction of feelings of anger, revenge, other hostile emotions
20. Assurance and confidence about any of the above

To what extent are such values capable of being integrated into various alternative basic educational policies? Clearly some cluster more easily than others; some would be difficult to apply in a manner consistent with the others.

We rather assume that the educational system will continue to concentrate its planning on educational and societal resources, capabilities and constraints rather than more abstract perspectives. However, in our course we will discuss other perspectives so that some participants may choose and learn to explicate these perspectives better--and so that others may improve their understanding of the arguments against these perspectives. The objective is not to impart a superficial knowledge about one of these perspectives--any particular perspective, if posited in isolation, is likely to seem extremely persuasive--but enough knowledge of all the perspectives so that there will be at least a minimum level of competence and reliability in dealing with them, or in effect a significant raising of the general level of discussion of these issues.

It should be noted that other sources of support permit us to carry on a general program of designing alternative world futures in other areas of both foreign and domestic policy. For example, we have a contract for a three-year program to develop for the Advanced Research Projects Agency of the Department of Defense (on behalf of the Office of the Director of Research and Engineering and the Assistant Secretary for International Security Affairs) an "Analytic Summary of U.S. Basic National Security Policy Issues." This analytic summary will be presented both in written and in course form. The program for the Department of Defense will combine an organized presentation of substantive material with a consideration of policy analysis as applied to national security policy.

Our principal clients for both the defense and the education courses are similar--heads of departments with broad responsibilities but technical backgrounds (e.g. the Assistant Secretary for International Security Affairs, and the Director of Defense Research and Engineering)--as well as both the faculty and the students of advanced professional schools such as the National War College, the Naval War College and the Air War College, and undergraduate colleges such as the Air Force Academy and West Point (with all of whom we happen to have established working relationships), and other professionals engaged in policy research in organizations such as RAND, IDA, SRI, MITRE and SDC, etc. There is thus an overlap in the content and method of the courses appropriate to these various groups, which, in our experience, can be fruitfully exploited. This overlap can probably be made to work equally well with educational policy-makers and administrators at the federal, state, and local levels, including superintendents and members of Boards of Education or Boards of Trustees, as well as professors of educational philosophy or psychology, faculty members in other university departments, and primary and secondary school teachers.

The policy analysis part of the program proposed in this report would be an attempt to apply (with appropriate modifications) some relevant portion of Hudson Institute methodological approaches and concepts in an analogous way to educational policy. It would include, for example, both a consideration of the relevant levels of analysis for educational policy questions and a cross-cutting discussion of alternative educational strategies. We believe it would be particularly illuminating to investigate further how differing values, assumptions, and calculations with respect to education lead to different educational policies. We have made a start toward dealing with these issues under our current contract. The purpose of this, of course, will be to help make the educational policy-makers who attend the course capable of making the decisions for which they are responsible in a more sophisticated way, and in particular with a fuller understanding of the alternatives that are available to them.

In addition to the work we have done and will be doing for the Department of Defense on policy analysis, many of the ideas and pedagogical techniques developed in earlier work by Herman Kahn for the RAND Systems Analysis course would be applicable here. While many of the ideas discussed above are oriented toward educational considerations in a general way, we would make a further proposal to do special new work on educational policy _per se_. The presentation of the ideas and approaches developed in this work may be primarily as examples in connection with the methodological points discussed above, or it may be desirable to give them separate attention.

To propose an example of a study we might undertake, it would be quite useful to draw up a "histomap"--a systematic description at successive points in time--of the U.S. educational system and possibly of some of the systems of other countries. Our report on literacy in the year 2000 (see Part V) indicates that at least as a tentative conclusion the educational systems of various countries even with very different cultures tend to follow a similar pattern, needing about a century to educate a population from illiterate to literate. One of the crucial tasks of the educational system is that of acculturation, of converting pre-industrial to industrial, industrial to mass-consumption, and mass-consumption to post-industrial societies. And many of the issues that have appeared in the past are likely to recur. The study of them and the consequences of various patterns of handling them should be relevant to the future as well as to the past, and to the most advanced as well as to the less advanced states.

C. Comments on Policy Research for Education

1. Lead-Time

Educational policy-makers are becoming acutely aware that a child who finished kindergarten this year will be graduated from college in the class of 1984, and more than half his life may be lived in the twenty-first century. There is increasing concern that we have done little to assess the adequacy of the preparation he is already receiving for the distant future, when its effects will still be felt, but we can sketch some broad parameters along which future worlds are most likely to vary. Such an exercise, even if only partially successful, can provide a fruitful context in which to carry out five- to ten-year studies--which can influence immediate policy choices.

There is also the problem of timing. Much more than in, say, weapons systems, decisions made today shape our educational situation and commitments in the 1970's and 1980's. We estimate that the educational system, as a whole, spends less than 10% of the proportion of its budget that the Defense Department spends on long-run policy research and planning. Yet the need to plan ahead is as great: the development and implementation of new curricula--to say nothing of new teachers, new teaching methods, and new school systems--take many years. Curricula must be devised now if they are to affect, from grade one onward, those entering the world of adults from high school in 1980, from college in 1984, or from professional schools toward the turn of the millenium.

2. Need for Shared Ideas

The "exponential" growth of knowledge popularized by Derek Price is now a well-known idea. This burgeoning of knowledge can be handled, if at all, only by the development of new "intellectual technologies." The issue becomes crucial for the planner or decision-maker who must make "rational choices" between fuzzy alternatives under concrete and immediate pressure. By supplying new knowledge in capsule forms, by focusing it specifically on the immediate area of decision, by presenting it "propaedeutically" and "heuristically," the policy researcher can help bridge gaps among knowledge, program, and action.

Beyond that, policy research must also recognize the larger problem, namely that this abundance of information, tied to enormous political and economic power, will be giving us an ever wider range of social choices; yet our present philosophies and institutions do not afford us the scope of vision and the flexibility to make these choices with the wisdom and responsibility they demand. Our crisis is not one of too much knowledge, for advancing learning should lead to greater simplicity, and greater ease of learning and instruction. It is rather that we lack a synthesizing view of man, a view that would constellate the randomness of our new knowledge and give direction to our new power of decision. Yet this very circumstance forces us to ask whether such a view is possible and what, after all, is the role of education as a transmitter of culture and of values.

As Douglas Bush, among others, has pointed out:

> ...for centuries Europe had a cultural solidarity that transcended national and religious boundaries. All or almost all the great original thinkers and writers had more or less the same kind of classical education and read, spoke, and wrote the same language, literally or metaphorically or both...*

But for post-industrial and post-Cartesian man, the unity of the world has been shattered. In education, each discipline has its own increasingly eosteric symbols, concepts, and jargon--and students are seceding from institutions of higher learning on the ground that they no longer educate and that because of this they are, in the word of the drop-outs, irrelevant.

3. Special Educational Needs of Decision-Makers

The desirability of explicitly educating decision-makers so that they are better able, in effect, to plan the destiny of the nation, or to carry out the plans formulated through a more democratic process, should be very seriously considered. One facet of this procedure would be the creation of a shared set of concepts, shared language, shared analogies, shared references. The authors of the Federalist Papers, the Declaration of Independence, and the U.S. Constitution may have done more long-range analysis and planning between 1775 and 1787 than has been done in any comparable historical period. These men shared a relevant frame of experience: they all had practice in business, law, public office, or local politics, and they had all read Locke, Hobbes, Montesquieu, Tacitus, Plutarch, and the

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*Quoted in Daniel Bell, The Reforming of General Education (New York: Columbia University Press, 1966), pp. 108-109.

Bible, from which they could illustrate their points without confounding their audience. In short, they could draw on a vast body of shared concepts and metaphors.

The quality of American discourse today--or lack of it--can be seen as a result of our loss of such a common conceptual vocabulary, partly because of the fragmentation of education. Universal re-teaching in the spirit of the humanistic tradition of Europe--at least for a comprehensive leadership group--might be useful in many ways. For example, there is a great deal of concern expressed today--among others by many city planners--about the problem of checks and balances and the obstacles they create to getting things done. Anyone familiar with Greek, Roman or even modern European history understands that very often the tyrant or the Caesar represented himself--and was accepted--as the champion of the masses against the oligarchs--that is, of the interest in getting things done for the masses over the interest in maintaining checks and balances held up by the vested interests and status quo groups. This understanding should enhance awareness of the rationale for checks and balances.

To the extent that we wish the educational system to preserve, enlarge and enhance democratic procedures, this kind of historical perspective may be of extreme importance, but clearly we will not be able to do anything like returning to the "classic" European tradition in education. We could, however, encourage certain kinds of courses, in history, politics, economics, the social sciences, which would be in effect courses in the study of the future, designed to present the relevant aspects of these disciplines. There is a certain superficial similarity here to the great books programs and the great ideas programs and the "man in civilization" courses of the past--and in fact there would be some overlap of material. The great difference would be in the attempt to focus on what is useful for thinking about the future, and to interpret and explain the future. Previously there was a kind of elitism in such studies, which were moreover inspired by a tendency to ape European culture; this meant the courses were both obviously superficial and apparently irrelevant to any serious concern in modern life. The courses we suggest, on the other hand, are deliberately designed to prepare people for modern life and for the future. They will be able consciously to use or consciously to reject the analogies of history, thus preventing many glib and inaccurate manipulations of such analogies, as well as encouraging their relatively valid and relevant--or at least dependable--uses. Although such metaphors can be misused, they carry too much useful information to be dispensed with altogether. For example, labeling a concession a "Munich" can be a useful categorization in the raising of important issues--to reject this categorization means, of course, to argue that the appeasement actually will appease the would-be aggressor, or is actually a compromise that simply conforms to current norms of international justice.

The policy researcher should also seek to recreate more effective discourse by identifying or inventing new metaphors appropriate to current experience and needs. Just as conceptual clarity can enhance the elucidation of issues in general, the judicious use of metaphors can effectively denominate the various possible views on an issue and the arguments that can be brought to support them.

4. New Skills Needed in the Post-Industrial Society

We cannot train people for jobs that do not exist, in industries that have not been created. But we do know that routine and labor-intensive jobs will be increasingly computerized and automated, and we can anticipate a preponderant need for people who are more proficient than ever in at least four areas of human "skills."

a. Cognitive processes--the traditional emphasis of education. As our society comes more and more to live by innovation and growth, greater primacy will be placed on the ability to codify particular knowledge into general theoretical systems which can be related to many diverse situations, as distinguished from more specific kinds of information and technical skills.

b. Emotional growth. Effective management is quintessentially an exercise of sensibility in human relations, for example in "fitting the man to the job" and creating the conditions in which various personalities can work creatively together. In the complex organizational structures of the future, made possible largely by computers and other managerial hardware, the "soft" skills of face-to-face sensibility will be needed at least as much as today. Moreover, emotional development as an end in itself has often been neglected in the schools in comparison with intellectual development, and for a number of reasons not all of which are likely to remain persuasive under future conditions.

c. Aesthetic concerns. Increased affluence and leisure will be reflected in an expanded social concern and consumer market for artistic activities, in the broadest sense of that term.

d. Ethical development. Ethical speculation is far from being considered a traditional economic activity. However, in the near future the vastly enlarged range of choices open to individuals and organizations, and the growing awareness of the complexity and the consequences of action, should greatly increase the public as well as the private value of more sophisticated and systematic, perhaps more formally organized, effort devoted to ethical issues.

Education for proficiency in these general activities, as well as in the traditional skills imparted by the educational system, represents not only individual and social gain, but an attractive and vital long-term national capital investment.*

5. Expectations and Policy Decisions

The proposed Hudson Institute course--and many other educational offerings of the future--should be concerned with technological, economic, political, and cultural prospects, and the opportunities and dangers they seem likely to present in the next several decades.

The purpose of speculating about the relatively distant future is not to "predict." A "crystal ball" is impossible; the future does not exist, and is indeterminate in crucial respects. In the usual "forecasting" model, one "looks at" the "future," and on the basis of what he "sees," forms expectations, and makes decisions that "change the future." (See Figure A.)

However, Figure B illustrates a more realistic procedure. The purpose of developing expectations about the more distant future is simply to furnish a better perspective on current trends and tendencies and thus to make decisions that are intended to intervene in these trends, in order to make future improvements. Moreover, expectations concerning the future are based, necessarily, on trends that connect the past with the present. Thus

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*These issues are discussed in somewhat greater detail by Richard Brown in Part VI, "A Role for Higher Education in Post-Industrial Society."

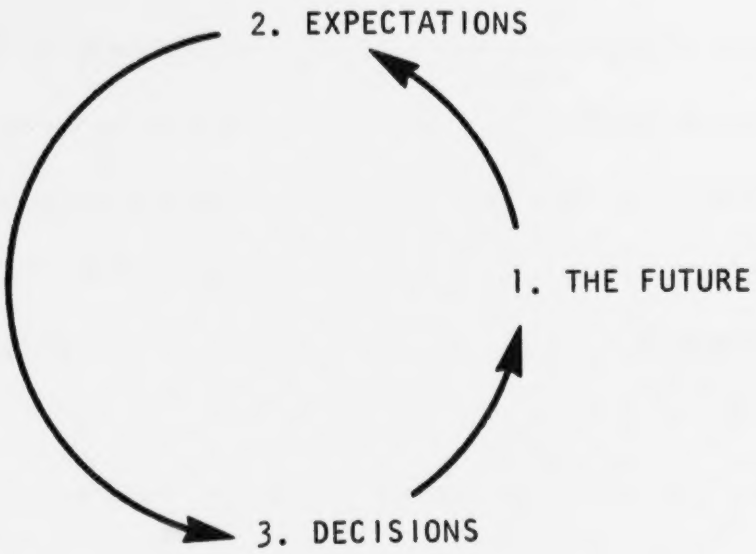
2. EXPECTATIONS
1. THE FUTURE
3. DECISIONS

FIGURE A. CRYSTAL-BALL FORECASTING

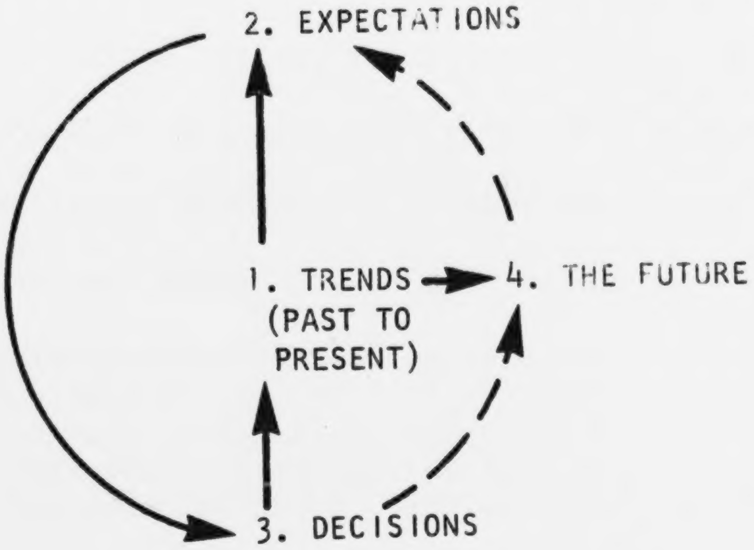
2. EXPECTATIONS
1. TRENDS (PAST TO PRESENT)
4. THE FUTURE
3. DECISIONS

FIGURE B. LONG-RANGE POLICY PLANNING

trends, and therefore history, play central roles in long-range planning. One must expect many "surprises" in the future, so that a simple continuation of current trends would in itself be extremely surprising. Yet any specific scenario containing particular surprises would be even less plausible. Thus the "design case" for long-range planning is the "surprise-free" projection. This rasies the question, "What are the very long-range tendencies that, in the absence of surprises, would probably continue?"

Among the important respects in which modern industrial society has differed, and differs increasingly, from pre-industrial societies are its unprecedented degrees of affluence, its even more extraordinary development of technology, and the institutionalization of secular, manipulative rationality.

Manipulative rationality is the basis not only of further economic and technological development but of certain typical cultural patterns and ways of life. These basic trends of Western society can be seen as a part of a common, complex trend of interacting elements--most of which can be traced back as far as the twelfth or eleventh centuries. For analytic purposes, we have separated them into thirteen rubrics,* as follows:

1. Increasingly sensate (empirical, this-worldly, secular, humanistic, pragmatic utilitarian, contractual, epicurean or hedonistic) cultures. This means in effect humanistic criteria for innovation and social norms, as opposed to traditional or religiously absolute criteria.
2. Bourgeois (including revisionist communist), bureaucratic, "meritocratic," democratic (and nationalistic?) elites. This means, in effect, decision-making by groups interested in rational calculation of costs and effectiveness, in "sensate" terms, of various alternatives, some of which may be novel.

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*Described in more detail in The Year 2000, op. cit., Chapter I.

3. Systematic accumulation of scientific and technological knowledge
4. Institutionalization of change, especially research, development, innovation and diffusion
5. World-wide industrialization and modernization
6. Increasing affluence and (recently) leisure
7. Population growth
8. Urbanization and (soon) the growth of megalopolises
9. Decreasing importance of primary (and recently) secondary occupations
10. Increasing literacy and education
11. Increasing capability for mass destruction
12. Increasing tempo of change
13. Increasing universality of the multifold trend

These processes of change, each facilitating the other, have become routinely--one might even say inexorably--exponentially cumulative. As a result the rate of change itself has also increased exponentially; while it is not likely that many of the changes that are in process will begin to decelerate during the next third of a century, it does seem likely that some of these trends will reach limits at some foreseeable point. Some of these trends present serious issues; indeed some of the problems created by our successes in achieving unprecedented kinds of economic and technological powers may even prove overwhelming.

The proposed course should examine in some detail hypotheses such as the following:

1. On the whole, given current political, economic, technological, and military developments, the likely instabilities do not seem to include major nuclear war or other dramatic military setbacks for the "old" nations, at least within this century.

2. Looking further ahead, however, the potential results of "progress" in military technology and in other forms of "Faustian" technological and economic powers seem to be reasons for sober concern, and perhaps even dread.
3. In any case, in the affluent societies, there should be a change toward a "post-industrial" and to some extent post-business (or perhaps "post-productive") society, characterized by dominance of the service, rather than the manufacturing sector, of non-profit motivation, and perhaps an erosion of advancement-oriented, work-oriented and achievement-oriented values. These likely changes would have marked cultural and aesthetic consequences which may be as important as the direct economic and political effects.
4. In the underdeveloped world, there is a serious danger of increasing disarray and irrational reactions to modernization and the impact of the West.
5. There are, however, attractive prospects for very high leverage and other new economic development prospects, which suggest something about patterns of innovation and development in many areas in the underdeveloped nations.

One of the great tasks of the future will be to facilitate intellectual preparation for the kinds of social decisions that will be required in the very affluent, extremely technological, rapidly changing, and partly post-industrial society that seems likely to come into being in the next few decades.

While it is usually desirable to solve old problems even when the solutions themselves give rise to new problems, it has become increasingly clear that our technological and even our economic achievements are mixed blessings. Through progress such issues arise as the accumulation, augmentation, and proliferation of weapons of mass destruction; the loss of privacy and solitude; the increase of governmental and/or private power over individuals; the loss of human scale and perspective and the dehumanization of social life or even of the psychobiological self; the growth of dangerously vulnerable, deceptive, or degradable centralization of administrative or technological systems; the creation of other new capabilities so inherently dangerous as seriously to risk disastrous abuse; and the acceleration of changes that are too rapid or cataclysmic to permit successful adjustment. Perhaps most crucial, choices are posed that are too large, complex, important, uncertain, or comprehensive to be safely left to fallible humans.

Intellectual preparation will probably require better understanding of issues such as the following:*

SOME ISSUES RAISED BY RAPID "TECHNOLOGICAL" CHANGE

1. INTRINSICALLY DANGEROUS TECHNOLOGY
2. GRADUAL AND/OR NATIONAL CONTAMINATION OR DEGRADATION OF THE ENVIRONMENT
3. SPECTACULAR AND/OR MULTINATIONAL CONTAMINATION OR DEGRADATION OF THE ENVIRONMENT
4. DANGEROUS INTERNAL POLITICAL ISSUES
5. UPSETTING INTERNATIONAL CONSEQUENCES
6. DANGEROUS PERSONAL CHOICES
7. BIZARRE ISSUES

1. INTRINSICALLY DANGEROUS TECHNOLOGY

A. MODERN MEANS OF MASS DESTRUCTION
B. NUCLEAR REACTORS--FISSION OR FUSION
C. NUCLEAR EXPLOSIVES, HIGH-SPEED GAS CENTRIFUGES, ETC.
D. RESEARCH MISSILES, SATELLITE LAUNCHERS, COMMERCIAL AIRCRAFT, ETC.
E. BIOLOGICAL AND CHEMICAL "PROGRESS"
F. MOLECULAR BIOLOGY AND GENETICS
G. "MIND CONTROL"
H. NEW TECHNIQUES FOR INSURGENCY, CRIMINALITY OR ORDINARY VIOLENCE
I. NEW TECHNIQUES FOR COUNTERINSURGENCY OR IMPOSITION OF ORDER
J. NEW "SERENDIPITIES" AND SYNERGISMS

2. GRADUAL AND/OR NATIONAL CONTAMINATION OR DEGRADATION OF THE ENVIRONMENT

A. RADIOACTIVE DEBRIS FROM VARIOUS PEACEFUL NUCLEAR USES
B. POSSIBLE GREENHOUSE OR OTHER EFFECTS FROM INCREASED CO_2 IN THE ATMOSPHERE
C. WASTE HEAT
D. OTHER SPECIAL WASTES
E. OTHER WASTES, DEBRIS, AND JUST PLAIN GARBAGE
F. [illegible] POLLUTIONS, ETC., ASSOCIATED WITH MANY MODERN ACTIVITIES
    1. [illegible] URBANIZATION
    2. [illegible] FARMING
    3. [illegible] TOURISM
    4. [illegible] FERTILIZERS, [illegible] ETC.

3. SPECTACULAR AND/OR MULTINATIONAL CONTAMINATION OR DEGRADATION OF THE ENVIRONMENT

A. NUCLEAR WAR
B. NUCLEAR TESTING
C. BACTERIOLOGICAL AND CHEMICAL WAR OR ACCIDENT
D. ARTIFICIAL MOONS
E. PROJECTS WEST FORD, STORM FURY, STARFISH, ETC.
F. SUPERSONIC TRANSPORTATION (SHOCK WAVES)
G. WEATHER CONTROL
H. BIG "GEOMORPHOLOGICAL" PROJECTS
I. MILLION-TON TANKERS (TORREY CANYON WAS ONLY 111,825 TONS) AND MILLION [illegible]
J. OTHER ENTERPRISE OR MECHANISM OF "EXCESSIVE" SIZE

4. DANGEROUS INTERNAL POLITICAL ISSUES

A. COMPUTERIZED RECORDS

B. OTHER COMPUTERIZED SURVEILLANCE

C. OTHER ADVANCED TECHNIQUES FOR SURVEILLANCE

D. EXCESSIVELY DEGRADABLE (OR UNRELIABLY REASSURING) CENTRALIZED CAPABILITIES

E. IMPROVED KNOWLEDGE OF AND TECHNIQUES FOR AGIT-PROP AND OTHER MEANS OF CREATING DISTURBANCES

F. IMPROVED KNOWLEDGE OF AND TECHNIQUES FOR PREVENTING DISTURBANCES

G. COMPLEX OR CRITICAL GOVERNMENTAL ISSUES LEADING TO EITHER "TECHNOCRACY" OR "CAESARISM"

H. NUCLEAR WEAPONS AFFECTING INTERNAL POLITICS

I. EXCESSIVELY ILLUSIONED ATTITUDES

J. OTHER DANGEROUS ATTITUDES

5. UPSETTING INTERNATIONAL CONSEQUENCES

A. BOTH NEW AND "TRADITIONAL" DEMONSTRATION EFFECTS

B. TECHNOLOGICAL OBSOLESCENCE OF "UNSKILLED" LABOR--POSSIBLE

C. NEW SYNTHETICS--E.G., COFFEE, OIL, ETC.

D. FORCED MODERNIZATION

E. GROWING GUILT FEELINGS BY MANY IN WEALTHY NATIONS--PARTICULARLY AMONG THE ALIENATED OR YOUNG

F. INEXPENSIVE AND WIDELY AVAILABLE "REALISTIC" COMMUNICATIONS AND PHYSICAL TRAVEL

G. ACCELERATED "BRAIN DRAINS"

H. CHEAP (SYNTHETIC?) FOOD

I. CHEAP EDUCATION

J. CONTROL AND EXPLOITATION OF THE OCEANS, SPACE, MOON, AND EVEN THE PLANETS

6. DANGEROUS PERSONAL CHOICES

A. CHOOSE SEX OF CHILDREN

B. GENETIC ENGINEERING

C. SUPER-COSMETOLOGY

D. LENGTHY HIBERNATION OR PRESERVATION OF CORPSES FOR POSSIBLE LATER REVIVAL

E. PSYCHEDELIC AND OTHER MOOD-AFFECTING DRUGS

F. ELECTRONIC STIMULATION OF PLEASURE CENTERS

G. OTHER METHODS OF SENSUAL SATISFACTION

H. DROPPING OUT AND OTHER ALIENATION

I. OTHER EXCESSIVE PERMISSIVENESS AND SELF-INDULGENCE

J. EXCESSIVE NARCISSISM

7. BIZARRE ISSUES

A. GENERATIONAL CHANGES. E. G. EXTENDED LONGEVITY

B. MECHANICALLY DEPENDENT HUMANS, E.G. PACEMAKERS, DIABETICS

C. LIFE AND DEATH FOR THE INDIVIDUAL, E.G. ARTIFICIAL KIDNEYS, ETC.

D. NEW FORMS OF HUMANITY, E.G. "LIVE" COMPUTERS

E. "FORCIBLE" BIRTH CONTROL FOR "IMPOSSIBLE" GROUPS OR NATIONS

F. OTHER EXTERNAL CONTROLS OR INFLUENCE ON WHAT SHOULD BE A PERSONAL OR EVEN INSTITUTIONALLY PRIVATE CHOICE

G. LIFE AND DEATH OR OTHER CONTROL OF "OUTLAW" SOCIETIES WHICH HOWEVER HAVE NOT YET COMMITTED ANY TRADITIONAL CRIME

H. EVEN THE CONTINUATION OF THE NATION-STATE SYSTEM

I. CONTROLLING AND LIMITING CHANGE AND INNOVATION

J. RADICAL ECOLOGICAL CHANGES ON A PLANETARY SCALE

K. INTERPLANETARY CONTAMINATION

A DYSTOPIAN SEQUENCE

1. A SERIES OF RELATIVELY SMALL CHANGES IS PROPOSED.
2. IN EACH CASE THE CHANGED SITUATION IS THOUGHT TO BE PREFERABLE (BY, SAY, A VOTE OF THE RELEVANT DECISION-MAKERS OR COMMUNITY) TO THE OLD SITUATION.
3. THE CHANGES ARE CUMULATIVE.
4. ONLY AFTER THE SERIES OF CHANGES HAS BEEN MADE DO PEOPLE THINK OF THE NEW SITUATION AS UNDESIRABLE OR DISASTROUS (OR DOES THE SITUATION BECOME ONE WHICH WE WHO INITIATED THE PROCESS WOULD JUDGE UNDESIRABLE).
5. YET IT IS NOW IMPOSSIBLE TO REVERSE THE SEQUENCE BECAUSE OF IRREVOCABLE CHANGES, TOO GREAT AN INVESTMENT, OR CHANGED VALUES.

WAYS TO GO WRONG

1. CRITERIA TOO NARROW
2. DECISIONS AT INAPPROPRIATE POINT IN THE STRUCTURE (FOR THE END IN VIEW)
3. INADEQUATE THOUGHT
4. BAD LUCK: UNKNOWN ISSUES
5. BAD LUCK: UNLIKELY EVENTS
6. CHANGES IN ACTORS
7. INAPPROPRIATE MODELS
8. INAPPROPRIATE VALUES
9. OVER- OR UNDER-DISCOUNTING OF UNCERTAINTY OR OF THE FUTURE
10. THE BEST MAY BE THE ENEMY OF THE GOOD (AND SOMETIMES VICE VERSA)

OBJECTIVES OF FUTURE-ORIENTED POLICY RESEARCH

1. STIMULATE AND STRETCH THE IMAGINATION AND IMPROVE THE PERSPECTIVE
2. CLARIFY, DEFINE, NAME, EXPOUND, AND ARGUE MAJOR ISSUES
3. FORMULATE AND STUDY ALTERNATIVE POLICY "PACKAGES" AND CONTEXTS
4. CREATE PROPAEDEUTIC AND HEURISTIC METHODOLOGIES AND PARADIGMS
5. IMPROVE INTELLECTUAL COMMUNICATION AND COOPERATION
6. INCREASE THE ABILITY TO IDENTIFY NEW PATTERNS AND CRISES AND UNDERSTAND THEIR CHARACTER AND SIGNIFICANCE
7. FURNISH SPECIFIC KNOWLEDGE AND GENERATE AND DOCUMENT CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS
8. CLARIFY CURRENT CHOICES--(HEDGING, CONTINGENCY PLANNING. AND COMPROMISING)
9. BROADEN AND IMPROVE THE BASIS FOR BOTH POLITICAL DECISION-MAKING AND ADMINISTRATIVE ACTIONS IN DEALING WITH NEW TRENDS AND CRISES

THE BARGAIN OF FAUST

FAUST:
IF EVER I RECLINE, CALMED, ON A BED OF SLOTH,
YOU MAY DESTROY ME THEN AND THERE.
IF EVER FLATTERING YOU SHOULD WILE ME
THAT IN MYSELF I FIND DELIGHT,
IF WITH ENJOYMENT YOU BEGUILE ME,
THEN BREAK ON ME, ETERNAL NIGHT!
THIS BET I OFFER.

MEPHISTO:
I ACCEPT IT.

FAUST:
RIGHT.
IF TO THE MOMENT I SHOULD SAY:
ASIDE, YOU ARE SO FAIR--
PUT ME IN FETTERS ON THAT DAY,
I WISH TO PERISH THEN, I SWEAR.
THEN LET THE DEATH BELL EVER TOLL,
YOUR SERVICE DONE, YOU SHALL BE FREE,
THE CLOCK MAY STOP, THE HAND MAY FALL,
AS TIME COMES TO AN END FOR ME.

Goethe's Faust, Newly Translated with an Introduction Walter Kaufmann, Doubleday & Co., Garden City, N.Y., 1961, pp. 183-4.

Deciding, as a society, what should be done with new scientific, technological, and economic capabilities means developing a capacity to make judgments, or to appreciate judgments that have been made by "experts," on matters such as the evaluation and comparison of costs and benefits of alternative policies, and problems of various institutional arrangements for protecting interests such as those that comprise the following three pairs of related dilemmas:

1. A) preserving a willingness and capability for efficiently exploiting new technological opportunities,

   B) yet, at the same time, making social decisions to refrain from exercising dangerous options;

2. A) regulating centrally such choices as may be, in the aggregate, socially dangerous,

   B) yet, at the same time, preserving freedom of individual choice;

3. A) dealing publicly and explicitly with certain issues that have been heretofore left to the discretion of individuals or private groups (e.g., of physicians),

   B) yet, at the same time, preserving, in selected cases, the advantages of deferring or delegating explicit decisions.

6. The Standard World and Variations

The basic long-term multifold trend we described in some detail in The Year 2000 has many implications for the social and cultural context in which the graduates of the educational system will have to live, the demands that will be made on them as well as the opportunities open to them. For example, it will be a very small world, with massive tourism and people maintaining residence in more than one country. This implies the need for more cosmopolitan attitudes, for training in foreign languages (dialects?) or in cross-cultural and trans-cultural issues, communications and the like. The educational system will also substitute for the possible absence of stark life-and-death political and economic issues in the old nations, for this kind of reality testing. We may wish to teach much more macro-history, particularly much more about Greek and Roman culture and about other ancient cultures, their rise and fall. Man may have managed to gain control of his destiny for the first time in history; he ought to have some idea what has happened to the various societies before him.

We may make a surprise-free projection of the school system and the various demands on the system, keeping in mind the fact that in many situations the most surprising thing that can happen is to have no surprises. However, in The Year 2000 we considered several variations from the surprise-free projection for the world as a whole. Let us list them here, and ask what they might mean, briefly, for the educational system.*

a. More integrated, stability-oriented: This is a world in which there is relatively little emphasis on altruism on the part of the wealthy nations of the world, though they do a reasonable and competent job of taking care of the poor nations. In this world there might even be some difficulty in finding enough challenging "natural" projects to satisfy the needs on the part of youth to do something significant. One could imagine an expanded Vista and Peace Corps type activities to satisfy altruistic urges, although there will never be any lack of less dramatic, but still worthwhile projects. The components of national security are even less pressing concerns than they are today, and the phenomena of the dropout may grow, as a revolt against the society which seems to be interested only in material goods, peace and prosperity. The educational system can try to design individuals to fit this system, which means turning out good administrators; the traditional gentleman, the epicurean, even the stoic all have roles here. On the other hand, some effort might well be expended in trying to complement the system, that is, to create people much less oriented to the dominant values.

b. More integrated, development-oriented: Here is a situation in which the developed world makes a major attempt to improve the economic, social and political prospects of the underdeveloped world. There is a world-wide sense of mankind; everyone is his brother's keeper. Without question the educational system is being asked to train large numbers of people for work in the undeveloped world, and many large numbers of civilians come from the undeveloped to the developed world for training. The difficulties here have to do with the possibility of frustration, of ingratitude and revolt against the excessive paternalism of the developed world, of failure, of cultural aggression rather than cultural empathy, and so on.

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*See The Year 2000, op. cit., Chapter VI, for full discussion of these "Canonical Variations."

c. More inward-looking, with an eroded communist movement: Here again are many of the problems of the more integrated, stability-oriented world, except that there is not quite so much self-satisfaction in the world-wide sense. If the introversion comes from frustration and low morale, the phenomenon of the dropout and other kinds of erosions, such as the erosion of work-oriented, advancement-oriented, achievement-oriented values, may become quite severe. Again, the fundamental question the educational system has to ask itself is, "fight or further it?"

d. With eroded democratic morale and some communist dynamism: This would of course result in part from the educational system, which had failed to supply the needed values to fight communist dynamism, and its reversal will depend in part on the educational system's creating new values which have their own dynamism.

e. With a dynamic Europe and/or Japan: Here the issue may well turn out to be either an attempt to compete with these areas on the basis of more universal values and to overcome the inward-lookingness, or a return to older nationalistic values. There might be need for a great deal of training, and cultivation of the work-oriented, achievement-oriented, advancement-oriented values to compete with the revival or intensification of these values in Europe and Japan, so that we do not become another England, in effect a noncompetitive nation.

f. Greater disarray, with an eroded communist movement: Here the issues of why are you not your brother's keeper, why do you intervene in undeveloped nations, when do you stop the war between Bolivia and Paraguay, tend to be uppermost. There may be others such as the draft, volunteer soldiers, advisers; or an attempt at more or less throwing weight around to preserve order, or an attempt simply to watch what happens.

Of course one of the most fundamental decisions educational authorities have to make is whether to live with a trend, accelerate it, retard it, cope with it or expand it. Our own suggestion, for the time being, is that they encourage a "mosaic" school system to take account of the needs of what is likely to be a "mosaic society," with varying demands from different parts of the mosaic.

7. Introduction to the Mosaic Society

We might conceive of various kinds of character structures, all of them buried in an American national character, emerging in discrete groups: Americanized cynics (less hippy than the hippies but also less ascetic than the Greek cynics), Americanized epicureans (a withdrawal to personal, family, and emotional values), stoic reactions (the people who actually run the country have a sense of duty) and, of course, materialists, hedonists, the classic American gentlemen, and so on. There is a real possibility that their differences will be deliberately enhanced by the individuals involved--for example, by wearing characteristically different costumes--so that their styles of life will be conspicuous. When the sense of hierarchy disappears a large part of our alienation and so-called identity crises may be dissolved in openly exhibiting individual identification with some subculture, or sub-community. Similarly, one would expect various kinds of schools, particularly universities, to tend to identify with one or another of these subcultures. It also seems reasonably clear that the three major communities we have discussed elsewhere,* Boswash (from Boston to Washington), Chipitts (Chicago to Pittsburgh) and Sansan (San Diego to Santa Barbara), would not have uniform distributions of these various subcultures, and the tendency to harbor more members of one subculture than another will have spiraling effects. That is, those communities with more hippies are friendlier in various ways to the hippies and therefore acquire more hippies, both by emmigration and by nurture, while those which are more commercially, technologically, and business-oriented both create and absorb people of that sort. This might develop into a rather broad "division of labor" among the three areas, although they will not become internally homogeneous. And, of course, areas such as Cambridge will be flowering with subcultures, and to some degree individuals living there will belong to all the subcultures more or less simultaneously, though in varying degrees. In much the same way that advertisers selling essentially similar products deliberately attempt to achieve product differentiation, these essentially similar Americans will attempt to achieve personality and identity differentiation, and, of course, they will not be quite so similar. In short, the need to be different is very much likely to come to the fore; the desire and means to display differences will be there, and the cost will be very low. In the kind of "personal society" we project for the future, there will be little or no pressure to conform, except, of course, in those subcultures which insist on conformity, such as some hippies and most squares.

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*The Year 2000, op. cit., pp. 61-62.

8. Regional Variations

The problems of what we have called Boswash are likely to raise issues that call first of all for regional government of these areas, very possibly including regional educational systems, though these are less likely to be operative at the elementary level than at the post-graduate level. They are most likely to come about through the taxing power; a regional planning authority would become at least financially heavily involved in educational issues, simply by trying to equalize the poor and the rich neighborhoods within the region. It is even more likely that the federal government would assume this role, or there might be some combination of the two.

To the extent that the three megalopolises think of themselves almost as separate nations, they could easily adopt very different educational policies. This suggests that the three areas may encounter conflicts of interest, require separate representation, blocs in Congress, for example, or some other organizational expression which in itself might play an important role in causing the acquisition and dispersing of funds for education.

It may be useful to offer some "wild" and exaggerated speculations about how far these variations might go. Sansan might tend to be much more leisured, permissive, "hippie" than the others, while Chipitts would probably try hardest and longest to preserve traditional American values, and Boswash would probably opt for the elite position. The school systems might well turn out to be quite different, if the culture of the regions begins to vary dramatically. In fact, if our mosaic hypothesis is correct the mosaics may not be structured only within these geographical areas: the enormous mobility of the American population in the year 2000 could result less in amalgamation than in centrifugation, with like flocking to like. Geographical macro-improvisation would follow the micro-improvisation that occurred among families and individuals.

It is easily conceivable that such relatively minor differences could escalate into major differences. Thus, for example, small colleges might attempt to attract and maintain faculty and students with the appeal of some moral style of life and objectives rather than geographical convenience or academic specialization. It is easy to imagine the West Coast having many more hippie colleges than the East Coast and the Midwest having many more religious requirements or issues than either of the coasts. The schools would in turn tend to change the area around them and along with many other spiraling influences would have the effect of making high culture in these various areas very different. Specifically, one could imagine Boswash with ivy-league colleges and many more and more classical European models, the Sansan universities and colleges emulating the Southern California Bar-B-Q culture, the sport and open life, and the hippie and casual attitudes, and Chipitts steadily pursuing technology, business and commerce.

D. Conclusion

The need for more historical perspective on the future may be the most crucial issue for future educational policy. Our suggestion for a "mosaic" education system to fit the coming mosaic society hedges on the issue of historical perspective. Of course, from some points of view, for example Sorokin's, this mosaic society is in fact cultural chaos, both the cause and effect of a transition. But even if we accepted this argument we would still wish to mitigate some of the worst consequences. Whether or not one accepts Sorokin's pessimistic position, or one more hopeful, it seems clear that the mosaic emphasis permits a great deal of flexibility to the society, satisfies a great many conflicting needs, takes the edge off some of the major controversies and confrontations, and fits in very well with the pragmatic attitudes of the planners.

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PART TWO

PROBLEMS IN DEMOGRAPHIC PROJECTION FOR EDUCATIONAL POLICY PLANNING

By

Raymond D. Gastil

TABLE OF CONTENTS

Introduction. 2-iii

I. Projections of the U.S. Population 2- 1

Ia. Population Projection by Segmented Analysis. 2-22

Ib. Projecting Illegitimacy. 2-31

II. Projected Distribution of the Population 2-34

IIa. Speculative Suggestions on the Application of Segmented Analysis to Future Patterns of Mobility and Distribution . . 2-49

III. Final Note 2-56

INTRODUCTION

PROBLEMS IN DEMOGRAPHIC PROJECTION FOR EDUCATIONAL POLICY PLANNING

Perhaps in education more than in any other area a correct understanding of demographic trends in the American population is crucial for planning. This paper is an attempt to examine a number of issues which will help to illuminate the education projection problem. First, the most recent population projections of the Bureau of the Census and the theories behind them will be critically analyzed. The discussion will then turn to a theoretical method to improve prediction by looking at the fertility behavior of "segments" of the population, examining possible trends in the size of these segments. One conclusion will be that the "best guess" is a lower future population projection than that now generally used for planning.

The discussion will then turn to a description of the mobility of the American population, and considerations involved in its future distribution. We have less to offer here. The discussion will end by suggesting how the segmented analysis developed for fertility behavior might be applied to an understanding of mobility aspects of the population projection problem as well.

I. Projections of the U.S. Population

Most of those concerned with areas other than population itself confine themselves to considering an average of the Bureau of the Census' latest projections. Such an average is presented in Figure 1.* If plotted on semi-log paper we would see that the projected average essentially presents an even curve of the growth of the American population. In fact, following this curve the rate of growth would be seen to be declining slightly.

The age composition of the population for this kind of prediction is presented in Figure 2. Because of the nature of projections, there should be few surprises here. In the late 1990's the 55-64 group will still reflect the depression period, and will be abnormally small, while the 35-44 group will be relatively large as a result of the "baby boom" of the 1950's. It should be added to Figure 2 that the high school population will rise to a peak in the late 1970's as a result of the boom and then taper off. Falling numbers of births since 1961 will mean that the smaller first grade coming to school next fall will be followed for at least five years by smaller classes. Of course, for educators the question is: Will this be only a five year "wave" of smaller classes, a twenty year wave, or a permanent condition? In order to answer questions such as these we will need to go behind a simple averaging of the work of the Census Bureau, look in some detail at the alternative projections being offered by the Census Bureau, and examine the theoretical suppositions upon which their work is based.

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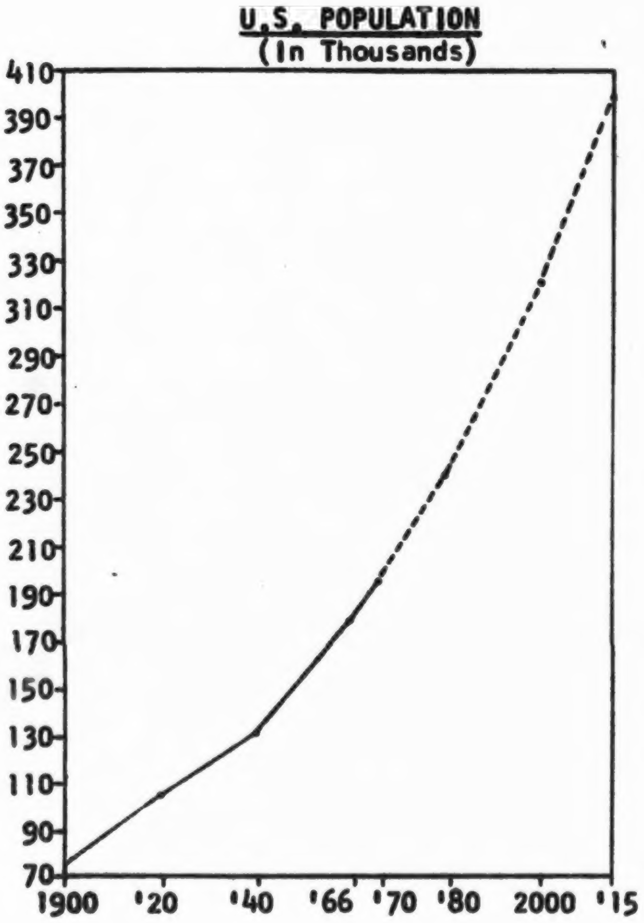
*Unless otherwise indicated the reference in section I is Bureau of the Census, Current Population Reports, "Projections of the Population of the United States," Series P-25, No. 381, December 18, 1967. They do not give an average projection, but this is a rough average of Table FF, p. 46. A slightly higher (B) projection has often been used in forecasting for other purposes.

FIGURE 1



Bureau of the Census, Current Population Reports "Projections of the Population of the United States," Series P-25, No. 381, December 18, 1967 (rough average of Table FF, p. 46)

FIGURE 2

U.S. Population by Age
(000)

	1965	2000	2020
Under 5	20,434	32,940	43,000
5-9	20,519	30,380	40,000
10-14	18,956	28,990	38,000
15-19	17,052	28,210	36,000
20-24	13,667	26,430	33,000
25-34	22,358	44,480	60,000
35-44	24,431	41,390	54,000
45-54	22,045	35,140	43,000
55-64	16,966	22,260	36,000
65 and Over	18,156	28,200	38,000
Total All Ages	194,583	318,420	421,000

SOURCES: 1965: U.S. Bureau of the Census, *Current Population Reports*, series P-25, no. 321, 1965, p. 11. Year 2000: two-thirds of the way from the B to the C projection of the Census Bureau in *Statistical Abstract of the United States*, 1965, p. 6. Year 2020: based on projections in U.S. Bureau of the Census, *Current Population Reports*, series P-25, no. 286, 1964, pp. 27, 56-57, 64. Census Bureau projections for population in 2010 were used, and our projection was postulated at two-thirds of the way from their B to their C projection. These figures were then carried ahead using five-year survival rates for 2005-10, age-specific birth rates for 2005-10 two-thirds of the way from the B to the C projected rates, and projected immigration rates.

Herman Kahn and Anthony J. Wiener, The Year 2000, The Macmillan Company, New York, 1967, p. 169, based on Bureau of the Census, P-25, No. 321.

The average projection is really based upon an interpolation of four projections (Figure 3). The variations among the four projections are not great for the next ten to twenty years for total population,although they may be very important for projecting numbers of births or numbers in school in these years. For example, in 1966 there were over 36 million persons age 5-13; the projections for this group in 1980 range from less than 33 million in the lowest, (D)[*] to 45 million in the highest (A). The implication of this range for educational planning is obvious.

The reasons for the differences among projections are fairly simple. They are not due to mortality changes. Mortality is expected to change very little in the next forty years, with longevity increasing at least as slowly as it has in the recent past (Figure 4). Incidentally, conquering cancer would increase average life expectancy about 2 1/2 years while "solving" all forms of heart trouble including stroke would increase expectancy more than ten years according to recent estimates.[**] Nonwhite mortality will decline more rapidly than that of the general population. It will be reduced by a combination of rising living standards and changing attitudes toward medicine.[***]

Net immigration is projected to be the same for all four projections. At 400,000 a year this is 100,000 more than in projections developed three years ago, and is slightly above current experience.

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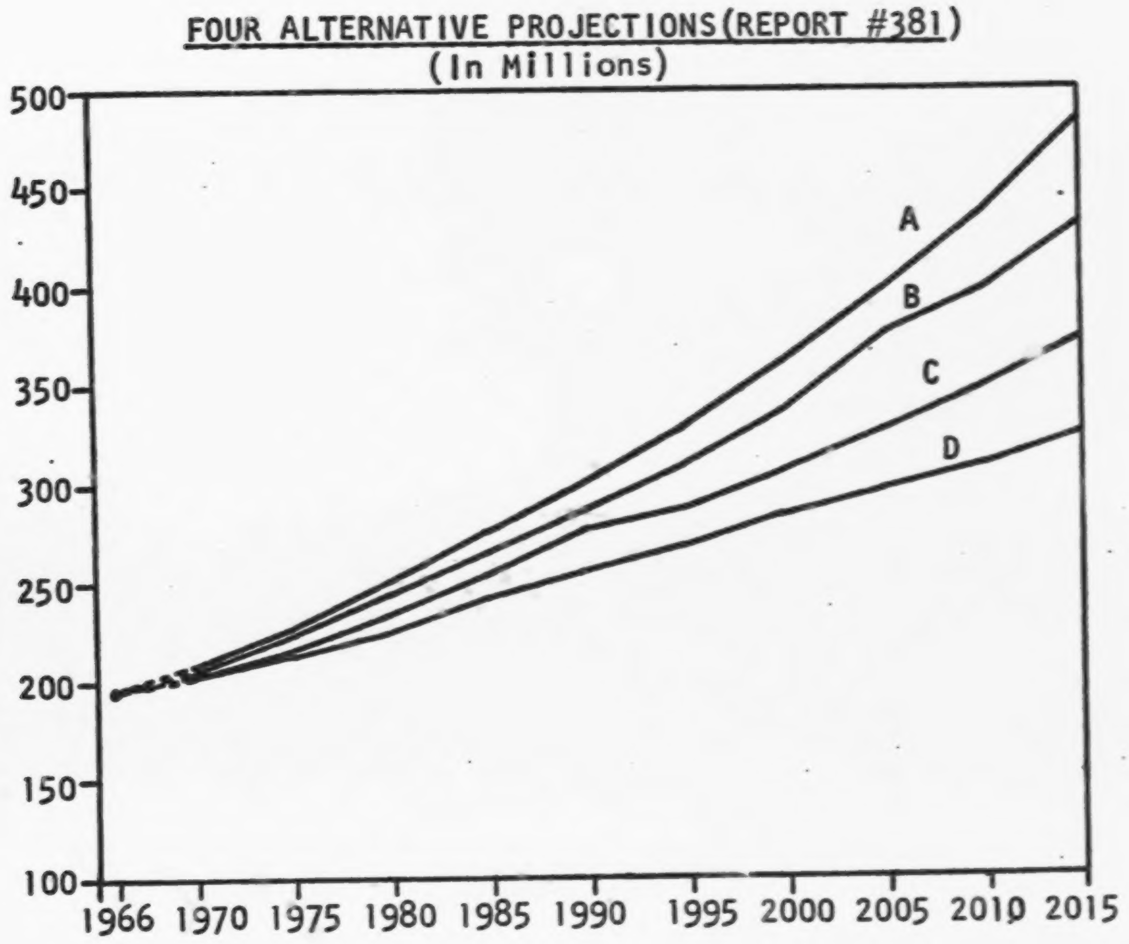
[*] Bureau of the Census, Series P-25, No. 381, _op_. _cit_., p. 80.

[**] _Ibid_., p. 37.

[***] On the latter see also Bureau of Labor Statistics/Bureau of the Census, BLS Report, No. 332, "Social and Economic Conditions of Negroes in the United States," October, 1967, pp. 61-65.

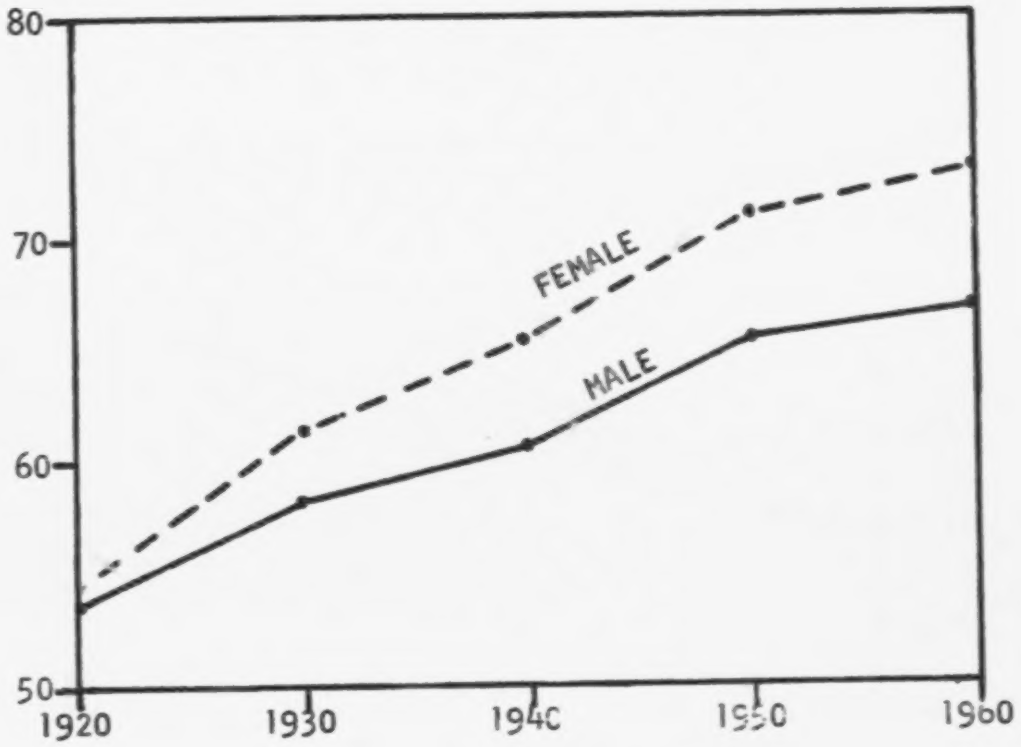
FIGURE 3



Bureau of the Census, P-25, No. 381, op. cit., Table FF, page 46.

FIGURE 4

LIFE EXPECTANCY OF MALE AND FEMALE



Statistical Abstract, 1967, p. 53, Table 61.

All variation in the projections, then, is due to alternative assumptions as to future fertility of American women and of the ages at which they will have their children. Figure 5 plots the four assumptions as to future levels of the "total fertility rate" in the four alternative Bureau of the Census projections. Total fertility rate is an artificial measure, calculated for each year, of the number of babies which 1000 women between 15 and 44 would have during their period of fertility if they continued to have children at age-specific fertility rates recorded for the year in question. The (A) rates are slightly below those recorded in the height of the "baby boom" while the (D) rates are slightly above those in the worst years of the depression.

Let us then turn to the arguments for or against accepting one or another of the four alternative projections. In order to do this we should consider some of the history of changes in birth and fertility rates.* Recent variations are recorded in Figure 6. If we extended fertility rates back into time we would see that it is estimated that the rate has fallen more or less steadily from 1800 to 1910, starting off at about 280/1000.** In Figure 6, I have added at the right hand margin the fertility rates calculated by the Bureau of the Census for the four alternative projections in the year 1970. It can be seen that if the authors of the Bureau of the Census projections think that their best guess projection would lie between (B) and (C), then the current trend of the fertility rate is expected to rapidly reverse itself. To some extent the present down trend should be halted simply because of the changing relative size of the chief childbearing group

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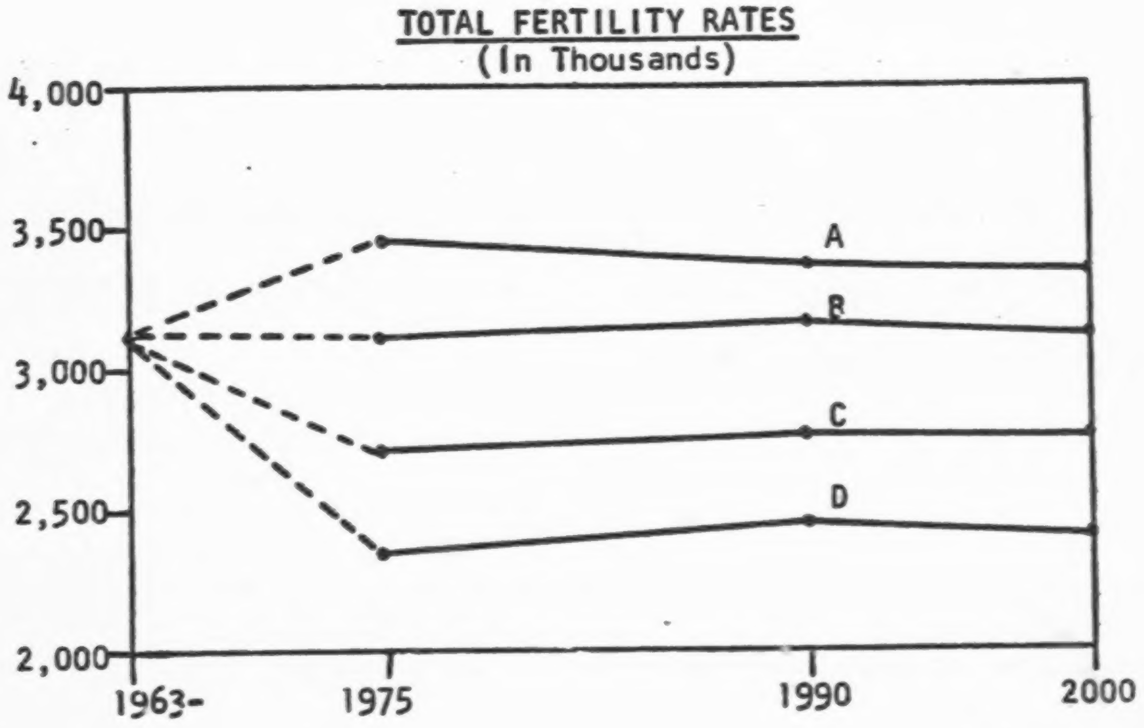
*The fertility rate is the number of children born per 1000 women 15-44 during the year in question.

**Historical Statistics of the United States: Colonial Times to 1957, Bureau of the Census, 1960, B-19-30.

FIGURE 5

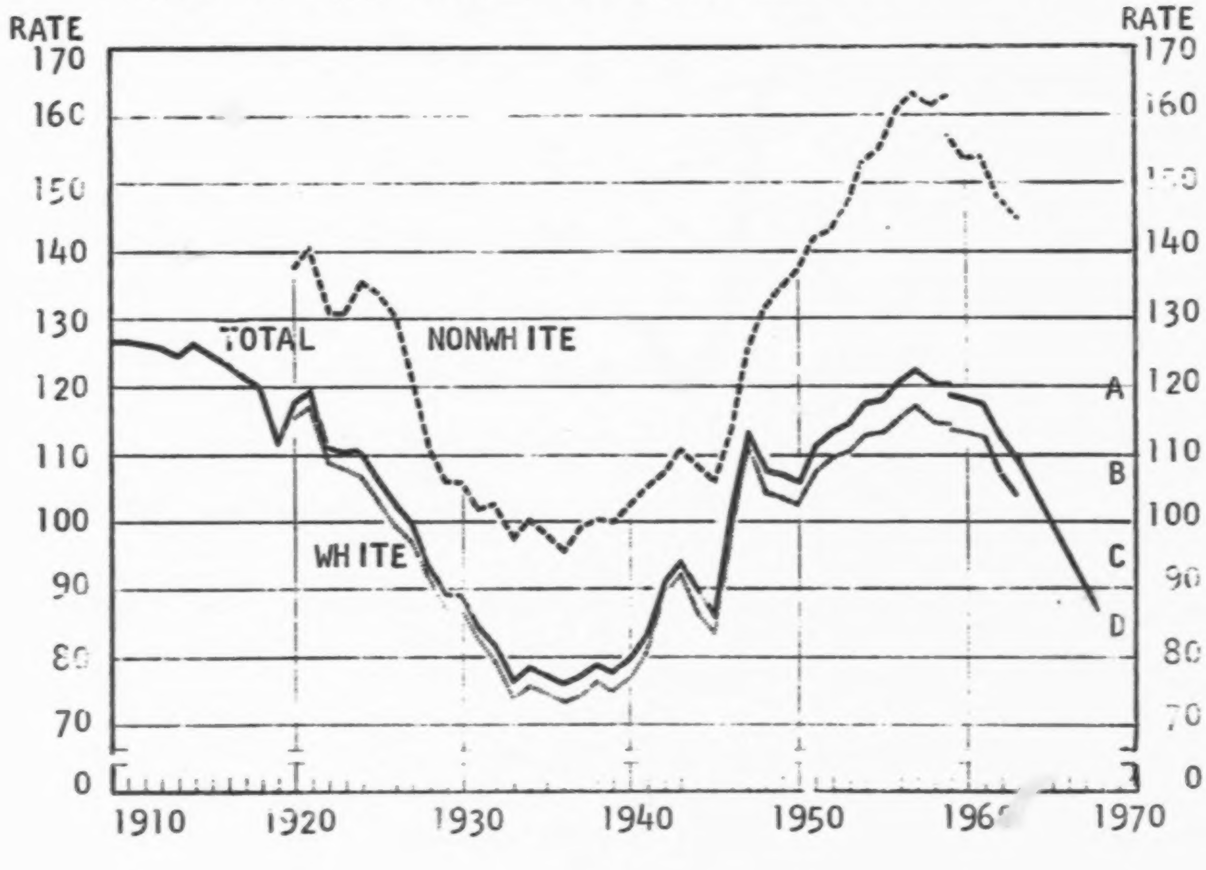


Bureau of the Census, P-25, No. 381, p. 30, Table T.

FIGURE 6

FERTILITY RATES: UNITED STATES

RATES PER 1,000 FEMALE POPULATION AGED 15-44 YEARS



U.S. Department of Health, Education and Welfare, Health Education and Welfare Indicators, September, 1965 and Public Health Service, Monthly Vital Statistics Report, December, 1967.

(20-30 years old) relative to the whole population to which the rate is applied (15-44). It is also reasonable to suppose that the population will not move toward extinction (e.g.70/1000). But it requires a more complicated argument, which we should now examine, to explain why the trend will turn back up as much as the Bureau of Census apparently expects.

Previous to the 1940's explanation of the fall in the birth rate in industrialized countries was based primarily upon relating this fall to the process of urbanization. Experience in America seemed to indicate that there was a direct relation between movement to the cities and a falling rate. It was assumed by some that this down-trend would even off at bare replenishment (about 2100/1000 total fertility rate) and thus produce eventually a stable population. Others feared that fertility rates might drop still lower unless the government intervened.

A supplementary explanation of variations in fertility rates on the bases of economic conditions has perhaps an equally ancient history, and in a very much modified form is perhaps the most influential theoretical model in use today. According to this theory, shorter term fluctuations in fertility can be explained by the economic experience and prospects of those who should be forming families at the time. According to this theory, low fertility in the depression is an illustration of the avoidance of births by people in difficult financial straits, while the large number of births in the 1950's correlated with a period of relative prosperity. I think, however, that it is important to note that a "man from Mars" without this theory might conclude from Figure 6 that the depression stopped and then reversed a falling fertility rate. Indeed, the fertility rate fell as fast in the 1920's as it did even in the early 1930's.

To this analyst it appears curious that the falling fertility rate since 1961 continues to be explained in terms of this economic theory. We are told that the young are "poorer" today than they were in the 1950's. The greatest convolutions are gone through to show us this "fact."* Actually, the figures simply do not show any trend of this sort. Figures 7 and 8 indicate that the last five years have been relatively good times for those most likely to have children.

One variety of the economic theory of fluctuations looks to the effect of economic conditions upon first marriages. Figure 9 illustrates recent variations in the median age at marriage for females. It does appear that a rapidly falling median age did accompany the "take-off" of the baby boom and improving economic conditions. However, the slow and indefinite rise in this age in the last five years does not seem to be enough to account for the recent decline in births.

More generally marriage rates and birth rates as shown in Figure 10 have not always followed one another closely. In the 1920's as marriage rates remained level birth rates fell rapidly. Since the middle 1950's the rates seem to behave differently. Figure 11 presents dramatically the way in which these trends have moved in opposite directions since 1963.

Figure 12 suggests that one accompaniment of this pattern of many marriages and fewer children seems to be that the important change from 1960 to today has been in second through sixth births. There has been relatively little change in the fertility rate for first births. (Parenthetically, it is interesting to note that since the depression there has also been little change in the rate for births at birth orders from seven up.

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*More detailed discussion of some of this material may be found in R. D. Gastil and Paul Berry, Alternative Birth Rate Projections to 1975 for Maternal and Child Health Planning, HI-607-RR, January 24, 1966, pp. 14-21.

FIGURE 7

UNEMPLOYMENT RATES

	WHITE	NONWHITE
1950	4.9	9.0
1953	2.7	4.5
1956	3.6	8.3
1959	4.8	10.7
1962	4.9	10.9
1965	4.1	8.1
1967 (PRE[illegible])	3.4	7.3

Bureau of Labor Statistics, Report No. 332 (and B of C, P-23, No. 24) "Social and Economic Conditions of Negroes in the United States," October 1960, p. 30.

FIGURE 8

UNEMPLOYMENT RATES FOR MARRIED MEN

	WHITE	NONWHITE
1962	3.1	7.9
1964	2.5	5.3
1966	1.7	3.6
1967 (PREL.)	1.6	3.4

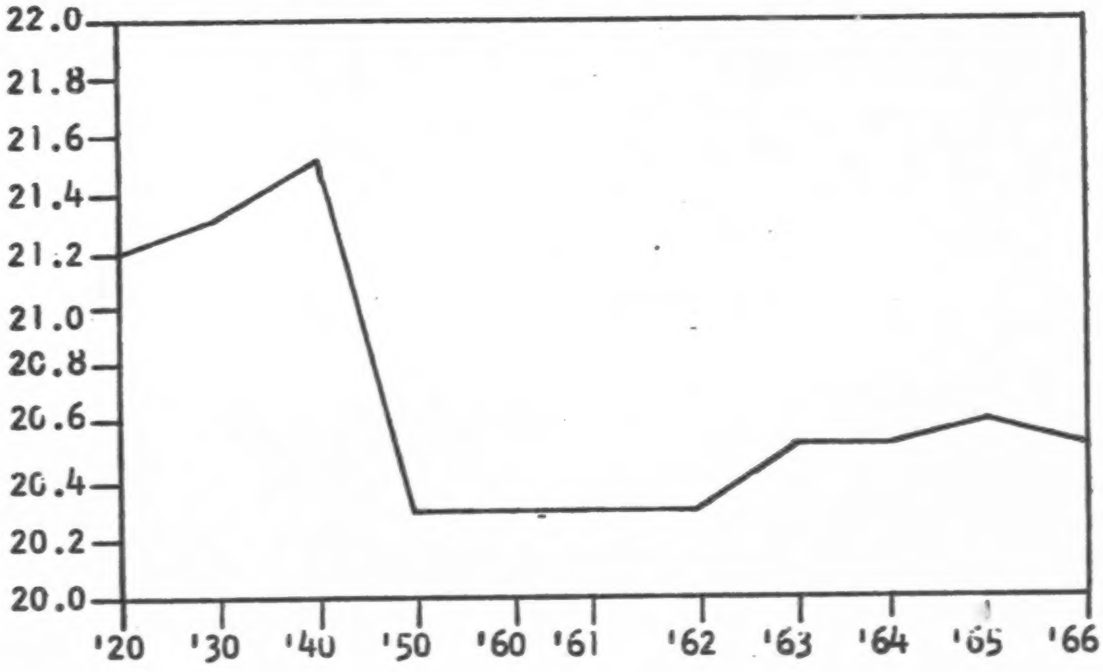
UNEMPLOYMENT 16-19

	WHITE	NONWHITE
1963	15.5	30.2
1966	11.2	25.4
1967 (PREL.)	11.2	26.3

Bureau of Labor Statistics, op. cit., pp. 31 and 33.

FIGURE 9

MEDIAN AGE AT FIRST MARRIAGE (FEMALE)

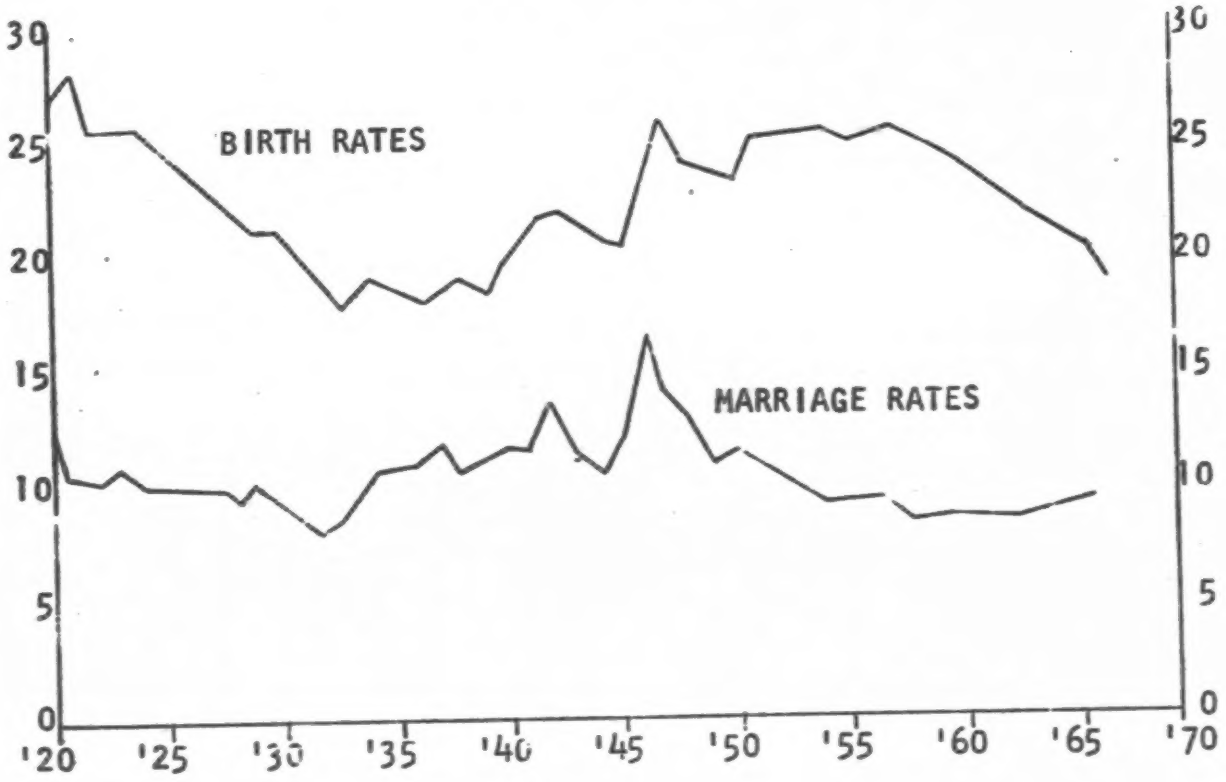


Statistical Abstract, 1967, p. 64, Table 75.

FIGURE 10

COMPARISON OF BIRTH AND MARRIAGE RATES

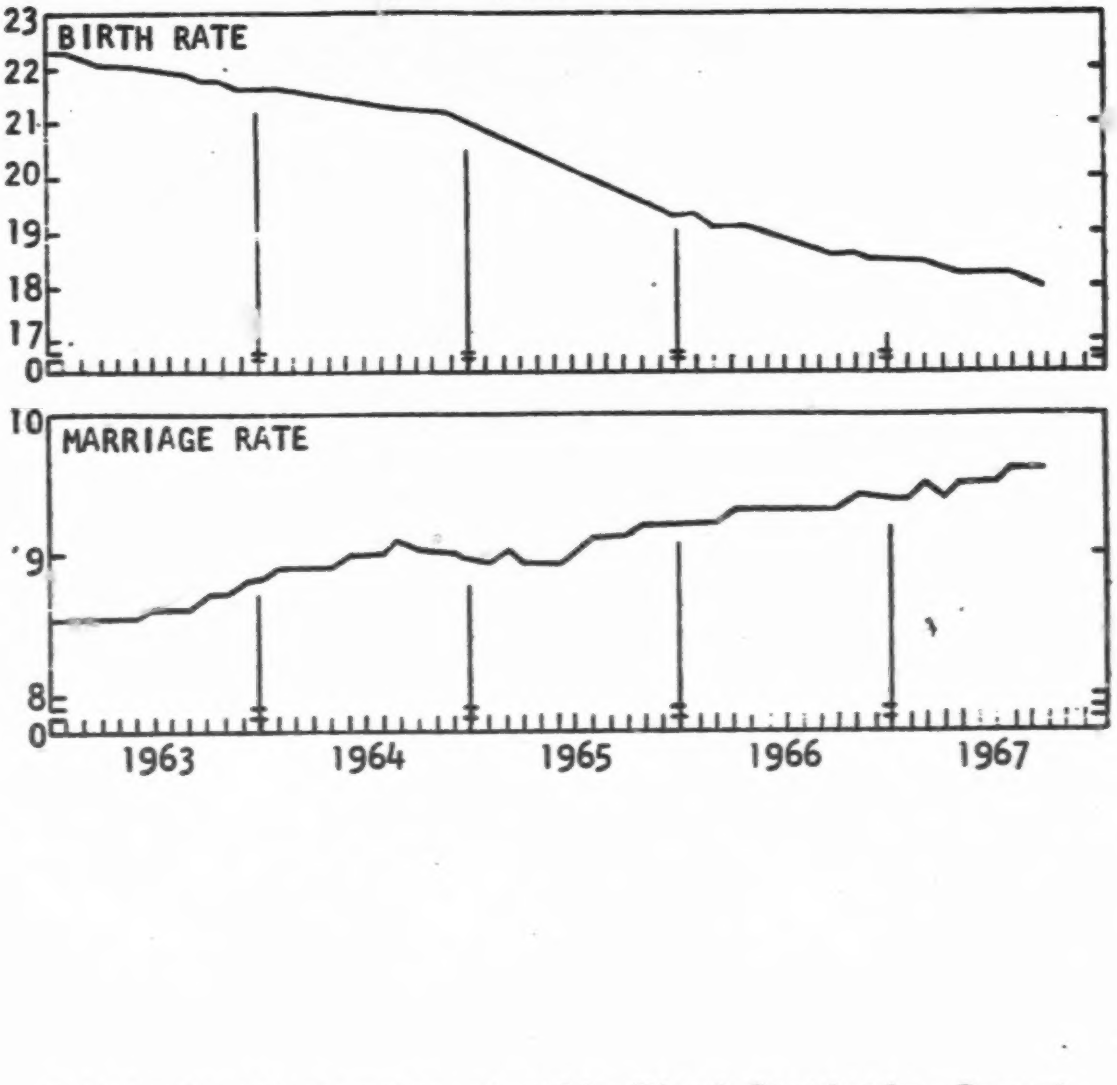
RATE PER 1000 POPULATION



Statistical Abstract, 1967, based on Figure V, p. 44.

FIGURE 11

RECENT MARRIAGE AND BIRTH RATES
(Per 1,000 Population)



Public Health Service, Monthly Vital Statistics Report, December 1967.

FIGURE 12

FERTILITY RATE BY LIVE BIRTH ORDER
(per 1000)

BIRTH ORDER	1940	1945	1950	1955	1960	1965
1	30	30	34	33	31	29
2	20	24	32	32	29	23
3	11	13	18	23	23	16
4	6	7	8	13	14	10
5	4	4	4	6	8	6
6	2	2	2	3	4	3
7	2	2	1	2	2	2
8 +	3	3	2	2	3	2
	78	85	103	114	113	91

Statistical Abstract, 1967, p. 50, Table 54.

2

Growing out of the economic explanation, Pascal Whelpton developed in the 1940's and 1950's the "cohort projection" method.* It is particularly important to realize that the Bureau of the Census seems to accept its approach and assumptions. This acceptance can be shown to have had a good deal of influence upon the current projections which we are considering here.

Whelpton believed that it could be shown that fertility rates appeared to show more variation in family size desires than in fact existed. He argued that the apparent variation was primarily the result of postponing or advancing childbearing in response to changing economic or other conditions. In line with this theory the 1930's were a time of postponement and the 1950's a time of advancing. To some extent the 1950's reached unusually high levels because of the combination of these effects. In addition, a falling age at marriage will tend to "pile up" births, but when this age levels out, then the birth rate will fall during the period of readjustment.

An essential ingredient in the Whelpton method is to look at actual groups of women born in particular years (birth cohorts) and then trace them through the childbearing years in terms of their marriage and fertility behavior. An aspect of this "tracing" is to use national interview samples of married women in order to determine a number of aspects of their fertility behavior. In particular the surveys attempt to determine how many children the different birth cohorts have had and expect. On this basis Whelpton and his colleagues were able to show that the very high fertility in the 1950's was probably a passing phenomenon and that fertility rates were bound to fall somewhat in the early 1960's. They could make this prediction because more women were telling them that they had completed their families than a simple extrapolation of age-specific fertility rates would have suggested. There was also some evidence developing by 1960 that the youngest childbearing cohorts in national samples were going to have fewer children than their older sisters.

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*Pascal Welpton, Forecasts of the Population of the United States, 1945-1975, Bureau of the Census 1947; and the Growth of the American Family Studies; Ronald Freedman, P. Whelpton and A. Campbell, Family Planning, Sterility and Population Control, McGraw Hill, 1959, and Whelpton, Campbell and Patterson Fertility and Family Planning in the United States, Princeton University Press, 1966.

The cohort projection method is limited in predictive value by the fact that the primary childbearing years are 20-30, and many women who will bear children at these ages cannot be usefully interviewed even 5-10 years ahead. Thus, the Whelpton material did not predict, and could not have predicted, the continuing and rapid fall in fertility rates since 1964.

Popularly, of course, the 1950's were seen as years in which parents simply wanted much larger families than they had wanted previously. The fact that every mother's of all ages were having more children in the 1950's than before can also be explained as a fad or fashion which swept over large parts of the society. Support for this position can be found in the pattern of rise in fertility. The peak of first parities was 1947, for second 1952, for third 1957, for fourth 1960-61, for fifth, sixth, etc., 1961. Age-specific fertility rates for ages 15-19 reached their height in 1957, for 20-24 the peak is 1957-1960. For 25-29 it is 1957-1961. For those 30-34, 35-39 and 40-45, 1957 was also the peak, followed by slow decline to 1961.*

In drawing up its current series of projections it appears that the Bureau of the Census was guided by two types of influences. First, it did not want to seem to be superficially responding to current information. Secondly, this conservative inclination was buttressed by the Whelpton method's assumption that short-term fluctuations are due less to changes in desired family size than to changes in age at marriage and desired spacing intervals.

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*This discussion is taken from Gastil and Berry, _op_. _cit_.

Popularly, many people believe that the improved methods of birth control, and their wide use in the population is responsible for the present down-turn. Demographers can, however, point to fertility behavior for both whites and nonwhites in the depression (Figure 6) which would seem to indicate the relative irrelevance of these methods. Thus, there is a reluctance among demographers to give much credence to the affect of birth control devices--except possibly to slightly raise the age at first marriage.*

This reluctance to respond to current trends is also evidenced by an important change in the basis of alternative projections between 1964 and today. If we look back to the Bureau of the Census projections in 1964 (Series P-25, No. 286) we will notice that there were also four projections (A,B,C,D) but that they were all somewhat higher than those today. The earlier projections,however, assumed the same number of children by completed fertility per 1000 women in an eventual leveling-off period (i.e., as in Figure 5 above). However, all four projections in 1964 were based upon the same age-specific fertility rates as in 1959-61. For the 1967 projections, the Bureau of the Census decided to vary age-specific rates according to "historical experience." Actually their historical experience consisted only of the experience of that group of cohorts which passed through their chief childbearing years in the 1930's. Thus, because fewer children seemed to be related to bearing children at later ages in the depression, the Bureau of the Census applied this experience to the late 1960's and 1970's in spite of a paucity of evidence that such trends are occurring today. Figure 13

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*They are more likely to see this also in terms of economic conditions See the report on a recent Population Association meeting (The New York Times), December 31, 1967. But see W. F. Pratt, "A Study of Marriages Involving Premarital Pregnancies," Ph.D. dissertation, University of Michigan, 1965.

FIGURE 13

AGE SPECIFIC BIRTH DISTRIBUTIONS

PERCENTAGES OF BIRTHS FOR ALL COHORTS

AGE	REPORT 286 (ALL PROJECTS)	REPORT 381-D
15-19	12.6	10.6
20-24	34.8	26.9
25-29	27.1	27.3
30-34	15.5	20.5
35-39	7.8	11.4
40-44	2.1	3.1
45-49	0.1	0.2
	100 %	100 %

Bureau of the Census, op. cit., Reports P-25, Nos. 286 and 381 (cf. No. 286, Table N and No. 381, Table S, p. 24.

shows the comparison of the projected birth rates for the low or D in projection B and the rates projected for D in 1964 (No. 286). The difference in these rates and the reason for them is important, because if we try to look at current experience and place this in relation to current forecasts, the "low" or D projection is below current behavior. But if we go back to the 1964 projections of what evolution toward 2450/1000 completed fertility would look like if we were moving toward it in the middle 1960's, then it would look as though current birth rates were falling well below the lowest projection (cf. Figure 14). My own feeling is that while there is likely to be some slight rise in average age at childbearing, if we were to take the last two years seriously, which is dangerous, we would project future completed fertility at the 2450/1000 level or lower.

Ia. Population Projection by Segmented Analysis

In a recent Hudson Institute study,* we experimented with using a segmented analysis for thinking about birth projections. We believe this has a number of uses, being capable of application as a methodology to a wide variety of analogous questions. In addition, our experiments here supported the hypothesis that a lower birth rate is likely to continue. For there should be a slight downtrend in completed fertility over the next few years, irrespective of changes in fashion. However, without changes in fashion and in birth control effectiveness,** the severity of the current drop could not be explained by this methodology.

The segmented analysis proceeded in two stages. In the first we attempted to look at completed fertility rates for standard segmentations. That is,

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*See Gastil and Berry, op. cit., pp. 23-58 for a fuller exposition and references.

**On the possible influence of improved birth control see ibid., pp. 55-57 and 87-94. The segmented analysis incorporates on these pages the birth control possibilities.

FIGURE 14

COMPLETED FERTILITY FINAL COHORTS		REPORT 286-D 2450	381-D 2450 (EARLIER)
PROJECTED POPULATION 1985-1986		248,000	242,000
YEARS	ACTUAL BIRTHS/1000-NUMBERS(1000)		
1956-1957	25.3-4310		
1960-1961	23.9-4350		
1963-1964	21.6-4119	20.9-3977	
1964-1965	20.4-3944	20.4-3944	
1965-1966	19.1-3742	20.2-3936	
1966-1967	(18.2-3600)	19.9-3928	17.9-3546
1967-1968		19.7-3930	17.8-3548
1968-1969		19.7-3992	17.6-3555

Bureau of the Census, Series P-25, No. 381, *op. cit.*, p. 22, Table R, pp. 51-52, and P-25, No. 286, especially Table I, Series D. Also *Monthly Vital Statistics Report*, December, 1967.

we looked at rates for whites, nonwhites, catholics, protestants, or those with different levels of income or education. Since education and income are continually changing and have been shown to be related to fertility rates, we were particularly interested in breakdowns in these terms.

Figure 15 shows the estimated effect on completed fertility of changes in educational levels. Women born between 1923 and 1932 played a central role in the baby boom of the late 1940's and 1950's. We could estimate their completed fertility on the basis of the 1960 census, the Growth of American Family studies, the work of Westoff and others at Princeton and other data. The educational differentials were primarily taken from the 1960 census (Women by Children Ever Born). This material was compared with the educational attainment projected by the Office of Education and on other bases for the women born between 1950 and 1954. These latter cohorts will be of central importance in the childbearing of the 1970's. If we hold completed fertility constant, and change only the percentages in the boxes, then the expected completed fertility falls by about 175/1000. Figure 16 illustrates the basis upon which the same process might be applied to income. We did not at the time have income projections of sufficient reliability and so did not follow the exercise further.

We next attempted to carry the segmentation approach a step further by considering "family planning segmentations." What we were looking for here were subgroups in the population whose fertility behavior has more internal consistency than that of persons falling into statistical categories broken down by income or education. There was a wide variety of different sources of information which went into this work. The interview data was first. Figure 17 shows, for example, that a large proportion of those having

FIGURE 15

PROJECTED COMPLETED FERTILITY (PER 1000)

EVER MARRIED	YEARS OF SCHOOL COMPLETED	PERCENTAGE '23-'32	PERCENTAGE '50-'54	FERTILITY '23-'32	FERTILITY '50-'54
	0-7	2.5	0.5	5000	
NONWHITE	8-11	4.5	4.0	4200	
	12 +	3.5	9.0	2700	
WHITE					
CATHOLIC		24.0	23.5	3700	
NON-CATHOLIC	0-7	4.5	1.0	4200	
	8-11	19.5	11.5	3150	
	12 +	37.0	46.0	2650	
NEVER MARRIED		4.5	4.5	100	
TOTAL POPULATION		100.0	100.0	ca 3100	2925

Raymond Gastil and Paul Berry, "Alternative Birth Rate Projections to 1975 for Maternal and Child Health Planning," Hudson Institute, January, 1966, pp. 28 and 32.

FIGURE 16

ESTIMATED COMPLETED FERTILITY (PER 1000)
(COHORTS OF 1923-1932)

EVER MARRIED BY FAMILY INCOME		% IN CLASS	FERTILITY
NONWHITE	BELOW $2000	2.0	4900
	$2000-$4000	3.0	4000
	$4000-$7000	4.0	3300
	$7000 AND OVER	1.5	2500
WHITE			
CATHOLIC		24.0	3700
NON-CATHOLIC	BELOW $2000	2.5	4000
	$2000-7000	32.5	3150
	$7000 AND OVER	26.0	2550
NEVER MARRIED		4.5	100
TOTAL POPULATION		100.0	ca 3100

R. Gastil and P. Berry, op. cit., p. 29.

FIGURE 17

WOMEN WITH UNWANTED MOST RECENT CONCEPTION (BY PARITY)

PARITY	WHITE	NONWHITE
0	-*	-*
1	-*	-*
2	11%	21%
3	28%	39%
4	41%	60%
5	45%	77%
6 +	47%	

Pascal Whelpton, Arthur Campbell, John Patterson, Fertility and Family Planning in the United States, Princeton, 1966, Table 200, p. 365. R. Gasti and P. Berry, op. cit., p. 91.

five or more children report that they do not want them. This is especially true of the nonwhite population. Figure 18 suggests that for the relatively uneducated women, farm background has a great influence on fertility behavior, even if the women now live in the city. It was necessary that this extra cultural information be fed back into the standard segmentations to get an idea of the numerical influence of these factors and the probable size of the groups.

Figure 19 presents a segmentation in terms of this kind of more speculative numerical treatment. The same cohorts of women are compared as in the educational segmentation above. The figures in parentheses are, of course, those for the 1950-54 cohorts. The reader will notice that the urbanized large, the wealthy suburban family is expected to become more common in percentage terms. Yet the effect of this growth is apt to be more than counterbalanced by reductions in the size of those groups which studies have shown have particular problems in planning families, by reductions in the numbers of those still following ruralistic cultural traditions, and in the numbers of those still desiring a large family for religious reasons. The urban small family corresponds to the fertility behavior of the more urbanized European societies, and has for many years. As it becomes still more dominant in America, fertility should drop. This more speculative approach suggests, then, a fall of 200/1000 in completed fertility.

The figures advanced in this last method are highly speculative, but they offer a considerable improvement in understanding. They suggest, for example, the scale of effect that a radical new decision of the Pope on

FIGURE 18

THE INFLUENCE OF FARM BACKGROUND ON FERTILITY

EDUCATION		NON-FARM RESIDENCE		FARM RESIDENCE
		NON-FARM BACKGROUND	FARM BACKGROUND	
ELEMENTARY,	0 TO 4	2.30	4.24	5.15
	5 TO 7	2.39	3.39	3.85
	8	2.43	2.77	3.53
HIGH SCHOOL	1 TO 3	2.38	2.46	3.26
	4	2.09	2.02	2.70
COLLEGE	1 TO 3	1.99	2.24	2.62
	4 OR MORE	1.95	1.91	2.18

Otis Dudley Duncan, Demography, 1965, Vol. 2, pp. 240-249. Also R. Gastil and P. Berry, op. cit., p. 47.

FIGURE 19

FAMILY PLANNING SEGMENTATION:
% OF WOMEN BY ESTIMATED COMPLETED FERTILITY (PER 1000),
COHORTS OF 1923-32 AND (1950-54)

	TOTALS	URBAN SMALL	CATH. SMALL	URBANIZED LARGE	RURALISTIC LARGE	RELIGIOUS LARGE	INEFFECTIVE PLANNERS	
							LOW	HIGH
EVER-MARRIED								
NONWHITES	10.5 (13.5)	3.0 (6.5)		(1.0)	2.5 (2.0)		1.5 (2.0)	3.5 (2.0)
WHITES CATHS.	24.0 (23.5)	6.0 (7.0)	3.5 (5.0)	2.0 (3.0)	1.5 (1.0)	8.0 (5.5)	1.5 (1.0)	2.0 (1.0)
NON-CATHS.	61.0 (58.5)	40.5 (42.5)		6.0 (8.0)	6.0 (3.0)		5.5 (3.0)	3.0 (2.0)
NEVER MARRIED	4.5 (4.5)							
TOTAL POPULATION	100.0 (100.0)	49.5 (55.0)	3.5 (5.0)	8.0 (12.0)	10.0 (6.0)	8.0 (5.5)	8.5 (6.0)	8.5 (5.0)
COMPLETED FERTILITY / 1000	3100 (2852)	2250 (2250)	2700 (2700)	3900 (3900)	4500 (4500)	4000 (4000)	3700 (3700)	6000 (6000)

R. Gastil and P. Berry, *op. cit.*, pp. 55 and 57.

birth control would be likely to have. They point out the possible effects of more adequate and generally accepted birth control methods on certain groups of the population. They point to possible trends in the size and characteristics of certain parts of the population. For example, as the nonwhite population moves through the cycle to small urban and finally to urbanized large, there may be a dramatic change in the outlook of this population. The number of lower class, often unwanted Negro babies, has statistically overwhelmed the production of middle class nonwhite babies in the 1950's. Thus, in spite of perhaps 35% middle class Negro adults, 80% of Negro children continued in the 1960's to start life in lower class homes. With present economic, educational, and birth control trends, this relationship may soon change, with very significant and snowballings effects upon the quality of the nonwhite population.

Ib. Projecting Illegitimacy

As a note it might be pointed out that the per cent of all births which are illegitimate continues to rise (Figure 19a). In terms of future projections of the need for special services for children and of welfare burdens this is important to realize. It needs to be mentioned because a decline in illegitimacy, particularly among nonwhites is being reported,* this optimism arises from the measure of illegitimacy which is most often reported. This "illegitimacy" ratio relates the number of illegitimate births to the number of unmarried females between 15 and 44. This rate is going down, but it is evidently not going down as fast as the rate of legitimate births.

If we examine Figure 19 we would expect that illegitimacy should decline with more education and with improved availability of better means of contracept

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*The New York Times, December 31, 1967 report on meeting of Population Association of America.

FIGURE 19a

ILLEGITIMACY BY PER CENT OF BIRTHS

	WHITE	NONWHITE
1940	1.8%	13.7%
1950	1.7%	17.0%
1960	2.3%	21.6%
1965	4.0%	26.3%

to the poor. However, it may be significant that the rise in reported illegitimacy seems to correlate with a rise in the availability of welfare support under ADC (Aid to Dependent Children). Although conditions are changing, today it may be as easy or easier to obtain welfare support for an illegitimate child as for a legitimate one. For lower class women who have little faith in men in any event, the change for them in the degree of economic disutility of an illegitimate birth may have played a considerable role in the rise in illegitimacy, and certainly in the rise in reported illegitimacy. Future changes in welfare laws in a direction which would reward rather than punish "father's" presence in the home could be expected to influence the future of illegitimacy. This is especially true among the poor, for it is here that illegitimacy becomes a problem of the community. Although there is some motion today toward change in these laws, I am not sure how decisive it will eventually be. Moreover, the rise in illegitimacy may well be due more to fundamental changes in social customs and attitudes than to the welfare programs.

II. Projected Distribution of the Population

The writer has much less definitive and new to offer in the area of projecting the location of future generations. However, for the individual state or community localized projections are likely to be more important than the over-all projection of the U.S. population.

All of us are aware of increasing urbanization and suburbanization. While there is talk of people tiring of the dull suburbs and returning to the city, the net movement to the suburbs continues. Raymond Vernon has suggested some very good reasons why this is so. Indeed, he sees the dreary rows of houses in Queens as the forerunner of a movement that will continue and for which there is plenty of land for at least another 25 years.* Increasingly there also is a growing tendency for the poor and nonwhites to move to the suburbs.** They are following the jobs. Vernon's suggestion that only the very wealthy and the managerial and cultural elite really have any long-term interest or need for the city suggests that future trends may dissolve entirely the urban concentration which we have known as the city.

The United States has been characterized since its beginning by migration West. This continues. In the projected regional distribution for 1985 of the Bureau of the Census (Figure 20), the most rapid growth will continue to be in the West, and nearly all of this growth will be in California. However, it is interesting to note that the relative sizes of the regions of the country will be the same in 1985 as today. Moreover, Figure 21 points out that the South will grow in absolute terms more rapidly than the West over this twenty year period. It is also well to note that

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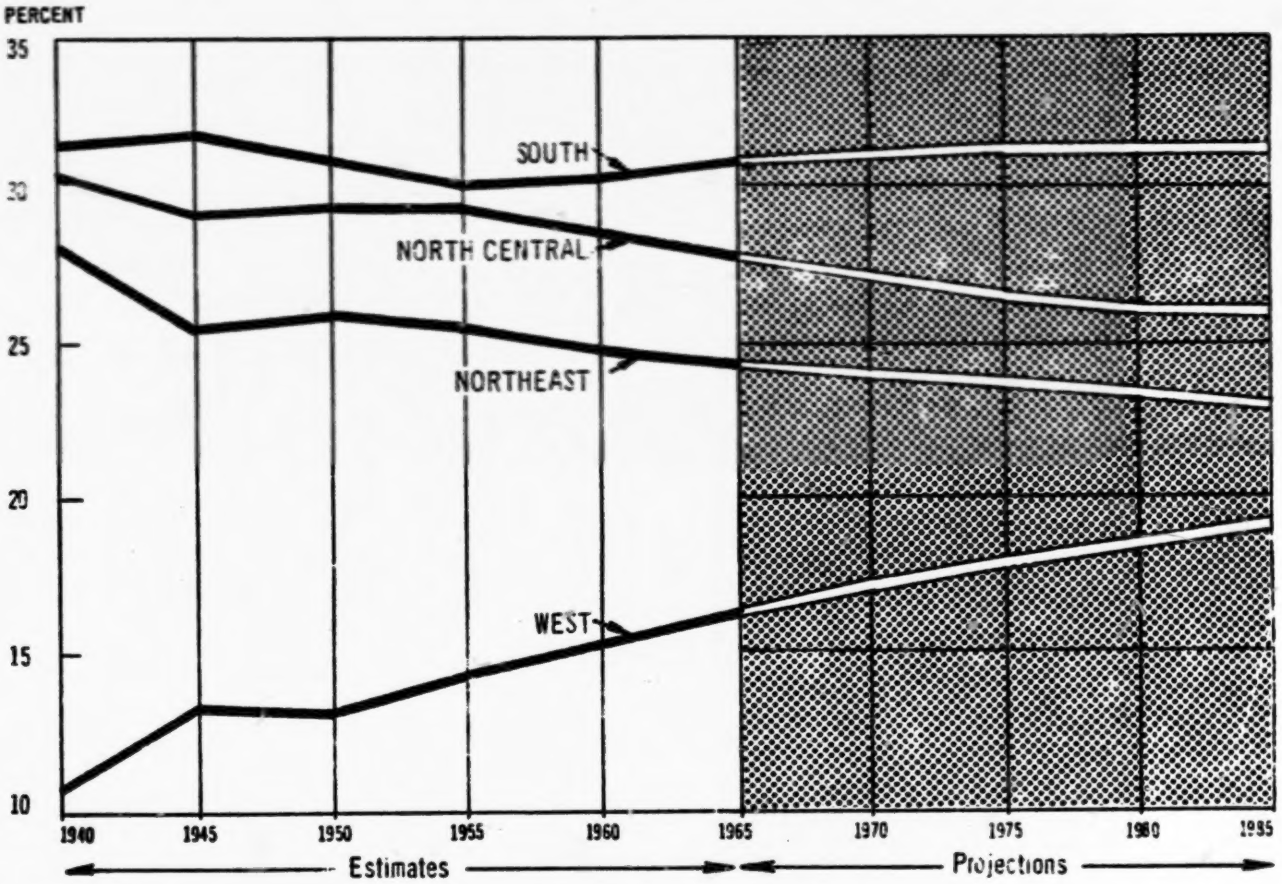
*Raymond Vernon, The Myth and Reality of Our Urban Problems, Harvard University Press, 1962 (66). Herbert Gans, "The White Exodus to the Suburbs Speeds Up," The New York Times Magazine, January 7, 1968.

** Raymond Vernon, Letter to the Editor, December 31, 1967.

FIGURE 20

REGIONAL DISTRIBUTION OF THE POPULATION OF THE UNITED STATES: 1940 to 1985



Bureau of the Census, "Revised Projections of the Population of States 1970 to 1985" Current Population Reports, Series P-25, No 37, October, 1967 (cover).

FIGURE 21

DISTRIBUTION OF POPULATION (IN MILLIONS) I-B

	1965	1985
NORTHEAST	47.6	61.0
NORTH CENTRAL	54.1	68.7
SOUTH	60.1	82.7
WEST	32.0	51.3

Bureau of the Census, P-25, No. 375, *op. cit.*, p. 1, Table A.

the population projection used to project distribution was the Census (B) projection. In terms of our discussion in Part I above, the absolute regional populations will be likely to be smaller than those suggested here.

States with particularly important changes are listed in Figure 22. It should be noted that generally the states with high net in-migration rates are also growing much faster from natural increase than those with low or negative migration rates. This is because out-migration is concentrated among those of childbearing age, giving a particularly unfavorable (high dependence ratio) age profile to the declining state. Thus, the effects of fertility and net migration are cumulative for both growing and declining states. The exception here is Florida, with its large retirement population.

Figures 23 and 24 suggest that the movement is intra-state as much as it is between states. Almost every state has its metropolitan area which continues to draw people out of the rural areas.*

There are, however, a limited number of area-wide growth patterns which can be discussed in the period 1940-1960, patterns of growth which are continuing today. Figure 24a sketches the areas in which this growth is continuing. Other maps could be drawn, for example with certain bands in the interior South, West Texas, and the Northwest. Generally, however, the rest of the country shows more of a pattern of scattered metropolitan growth than of rapid area-wide expansion. Much of the Gulf Coast and South Atlantic Coast growth areas (Figure 24a) still have counties with low

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*See also National Planning Association, Looking Ahead, June, 1967.

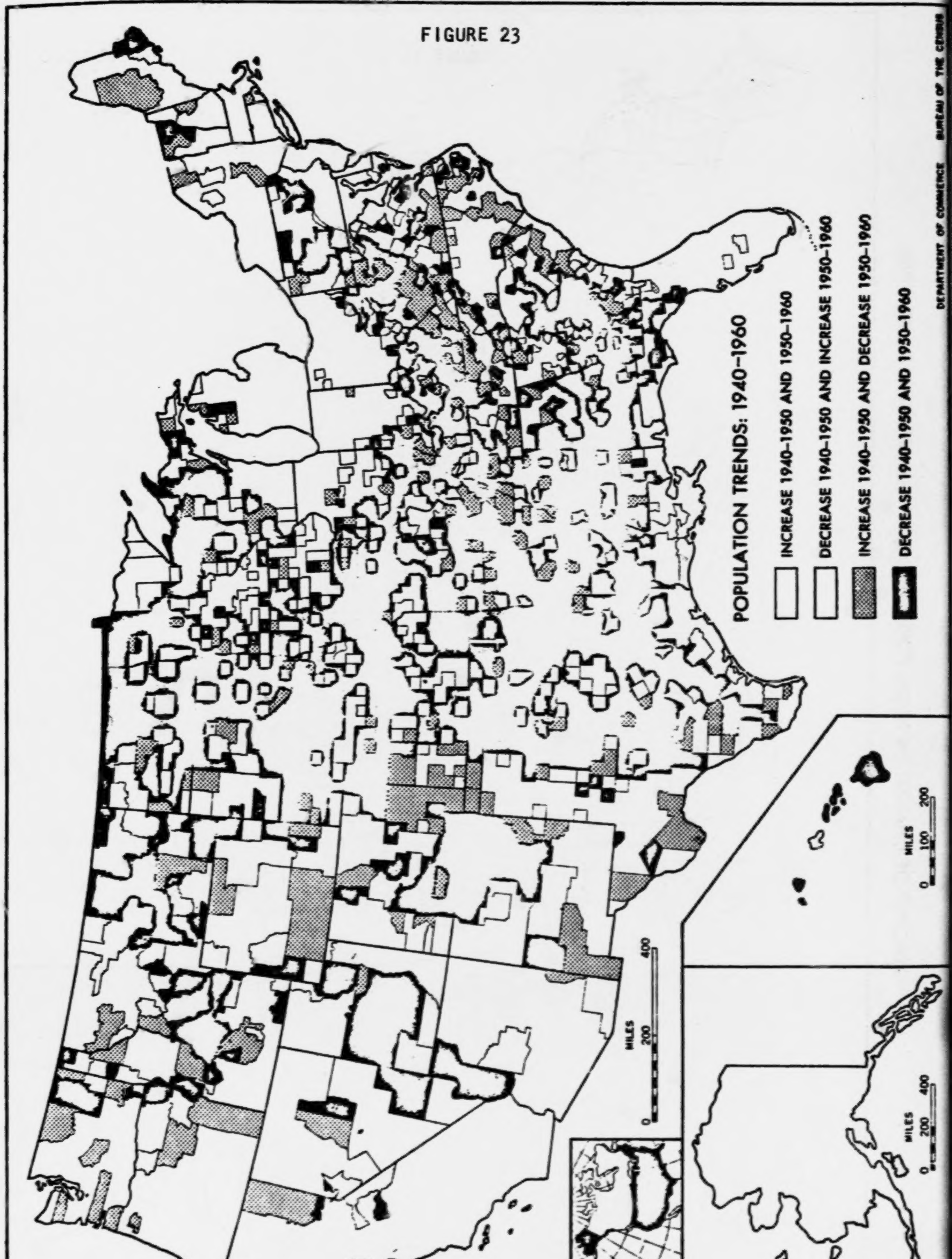
FIGURE 22

POPULATION CHANGE, SELECTED STATES	1965-1985 (PERCENTAGES)		
	(A) I-B	(B) WITHOUT MIGRATION	(C) A-B
ARIZONA	80.6	54.1	26.5
CALIFORNIA	72.3	43.8	28.5
FLORIDA	81.5	34.2	47.3
UNITED STATES	36.0		
IOWA	11.6	27.7	16.1
PENNSYLVANIA	15.3	24.6	9.3
WEST VIRGINIA	-0.3	26.9	27.2

Bureau of the Census, P-25, No. 375, op. cit., Table C, p. 5.

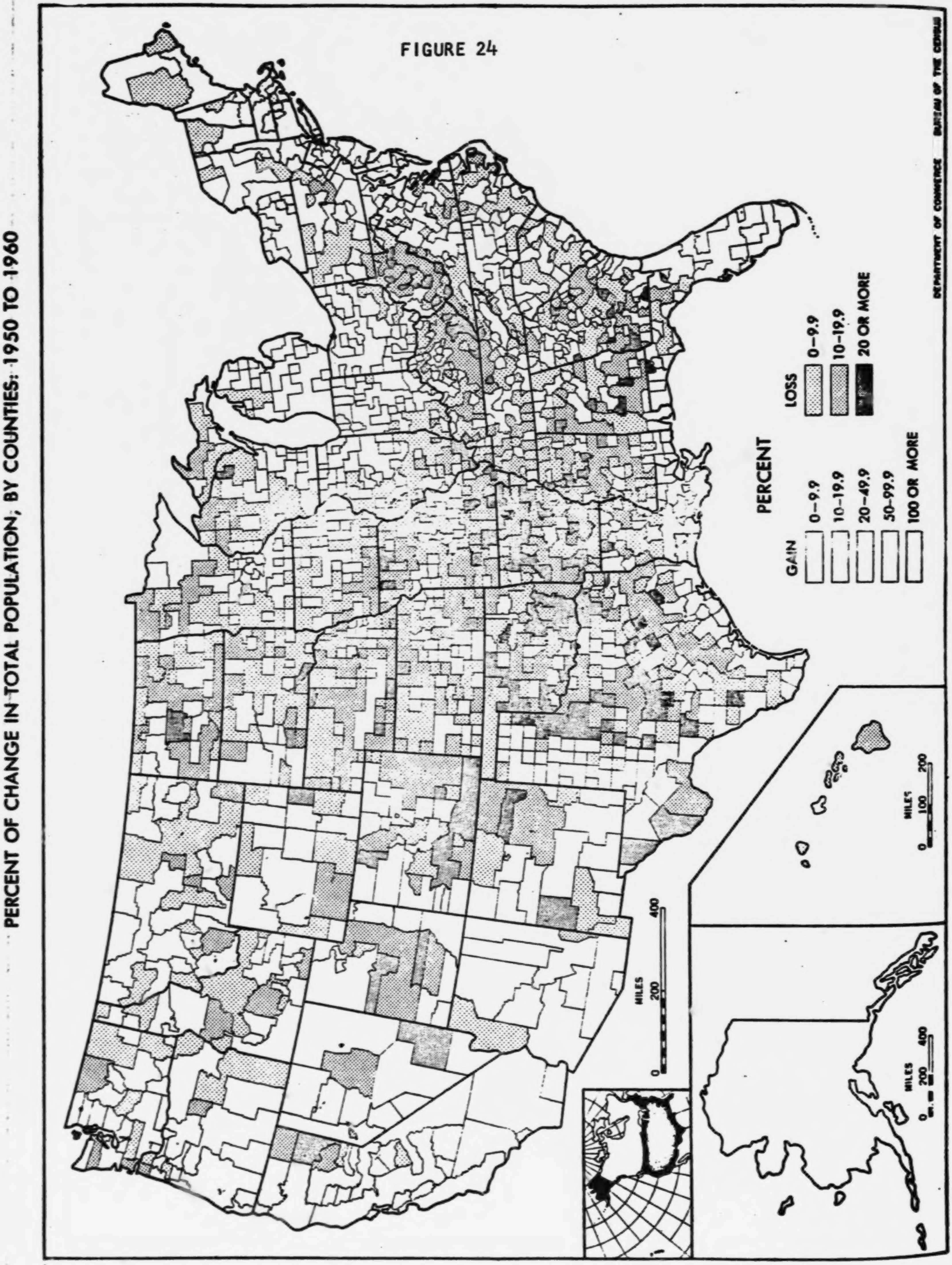
FIGURE 23

POPULATION TRENDS, BY COUNTIES: 1940 TO 1960


POPULATION TRENDS: 1940-1960
INCREASE 1940-1950 AND 1950-1960
DECREASE 1940-1950 AND INCREASE 1950-1960
INCREASE 1940-1950 AND DECREASE 1950-1960
DECREASE 1940-1950 AND 1950-1960
MILES
0
200
400
MILES
0
100
200
MILES
0
200
400
DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS

Bureau of the Census, 1960 Census of Population, Vol. I, Part I, page S-27, Figure 26.

FIGURE 24

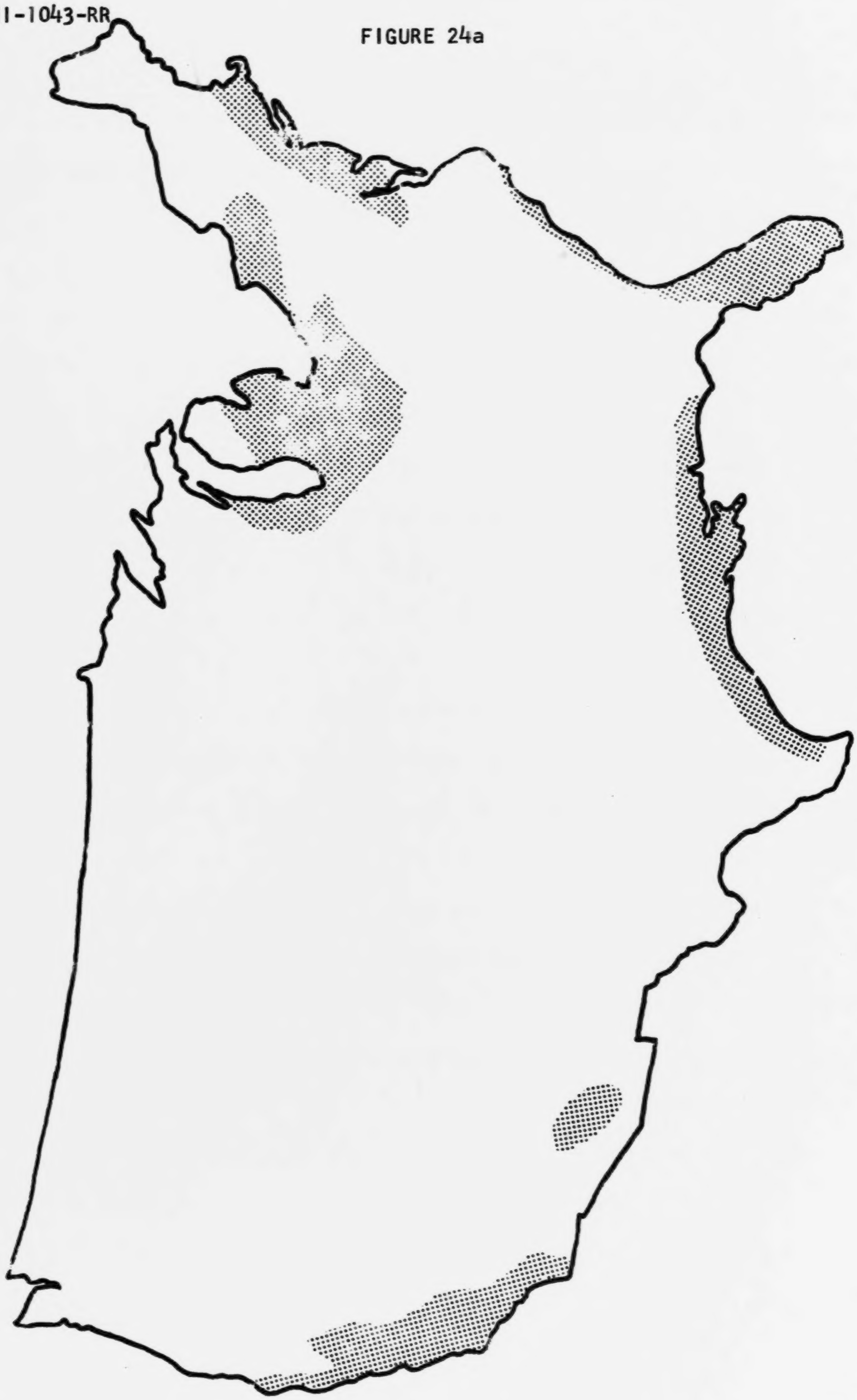


PERCENT OF CHANGE IN TOTAL POPULATION, BY COUNTIES: 1950 TO 1960

PERCENT
GAIN
0–9.9
10–19.9
20–49.9
50–99.9
100 OR MORE
LOSS
0–9.9
10–19.9
20 OR MORE
MILES 0 200 400
MILES 0 100 200
MILES 0 200 400
DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS

Bureau of the Census, 1960 Census of Population, op. cit. p. S-20, Figure 24.

FIGURE 24a



MOST SIGNIFICANT GROWTH AREAS: 1940-1960 population densities. In these areas the appearance of rapid growth here may be misleading, for rapid growth on a relatively small population base is not necessarily predictive of the future.

The reasons for movement to the Southern coasts and California are largely combinations of technology, distance and changing politics and culture. California is a more desirable climate for most people than the South, but it is further away from "home" for most of America. The acceptance of the technology of air conditioning developed more slowly than that of heating (central heating and car heaters). But in the South and the deserts today most classes afford and expect to live in air conditioning. This opens up much larger areas of the South to acceptable year around living for most Americans.

Ease of living draws together businessmen and high quality job aspirants into forms of production and service which are relatively divorced from primary sources of raw materials and heavy industry in the North. More jobs today are of this nature, and this trend will continue. In addition, the Aerospace Industry prefers Southern locations for instrumental reasons. To these "new" elements for population movement may be added the chance factors that certain industries such as aluminum, oil and natural gas have located in the South primarily because of the location of natural resources which are now greatly in demand.

Movement to the Eastern and Midwestern megalopolises is largely due to an increasing tendency to centralization in many industries and a decreasing reliance of the economy on primary sources of materials. Of course, to a considerable extent what is happening in these areas may be an illusion.

It is simply true that when industrialization took growth away from agriculture, there was already a greater concentration of urban centers in the Chicago-Pittsburg and Boston-Washington areas. As urban and suburban areas everywhere grew (see Figures 23 and 24), only in the latter areas did urban areas seem to grow together to form what is apparently an areal growth. But, to the development of a way of life, the intervening nonurban area between St. Louis and Kansas City may be of no greater significance than that between New York and Philadelphia.

Ease of travel, the reliance on the nuclear family, the depersonalization of our industrial society also makes more acceptable the idea of moving away from one's lifelong home to settle in a retirement area toward the end of life. Increasingly members of the upper middle class have had no lifelong home, so their choices are much freer. In addition, with the homogenization of society, the Southerner fears less to move North and the Northerner South. Indeed, in-migration to the Southern coast has already made many such areas as much Yankee as Southern.

The metropolitan areas of the country cannot continue to grow at current rates. In general as a metropolitan area grows, it finds it hard to keep doubling. The pool from which in-migrants are to come also is becoming progressively smaller. It has been pointed out that if all of the SMSA's grew at the rates being projected for them, in a few years they would have more than 100% of the projected U.S. population. Moreover, the total mobility rates for the country have not been rising (see below), therefore, the pool of mobile people is not enough to support continued rapid growth in the next generation in the same places and at the same rates it has occurred in the recent past. Figure 25 illustrates for Dade County (metropolitan Miami) one example of this general of tailing off of growth in favored metropolitan areas. Although still

FIGURE 25

DADE COUNTY POPULATION GROWTH

	ACTUAL	PROJECTED
1940	267,739	
1950	495,084	
1960	935,047	
1965		1,154,000
1966 (EST.)	1,145,410	
1970		1,467,000 (1,357,000)
1980		2,079,000 (1,845,000)
1990		2,813,000

Dade County Development Department, "Reflections of a Growing Industrial Community," 1967.

very successful, and bolstered in recent years by the Cuban influx, Miami is not going to make the median projections which seemed reasonable a few years ago on the basis of Miami's recent growth taken in isolation from the problem of growth and migration in the nation as a whole. The low projection (parenthesis) is probably more accurate.

Figure 26 suggests that there has been a slow but fairly steady growth in the movement of the population from state to state since 1900. It is interesting that this increase should be as slow as it has been despite radical changes in transportation and communication. Of course, while the ease of moving to a point has improved, the ease of returning to the point of origin has improved as much. This may account partially for the fact that places with high net in-migration have as much out-migration as these with high net out-migration (see below). Figure 27 points out that mobility out of county of birth on a yearly basis has been remarkably stable since 1948. About half of those moving out of a county move to another state and half of these again move beyond neighboring states. These percentages have also been quite stable over the last twenty years.*

Mobility rates vary with a number of factors. White mobility out of a county is twice as high as nonwhite mobility. Higher education and income are related to greater mobility. For example, long distance moves are twice as common for the college educated as for other educational levels. Those 20-34 are more than three times as likely to move as those 60-80. More detailed studies have pointed to the fact that those with property and businesses are much less likely to move than those with none, while certain professionals such as teachers and ministers are quite mobile.**

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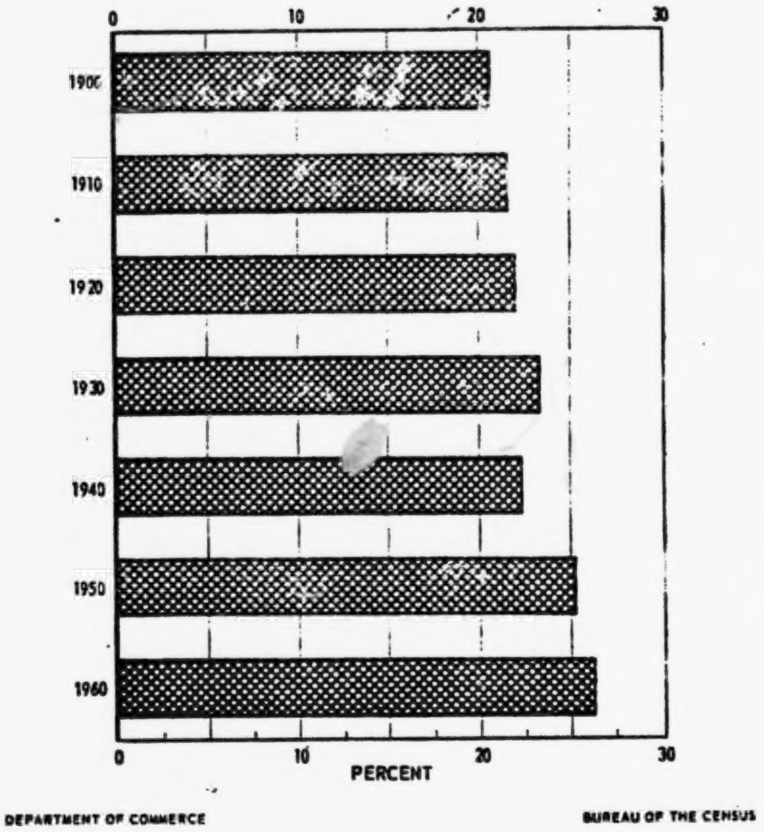
*Everett Lee, "Redistribution in the United States," in R. Freedman (ed.) Population: The Vital Revolution, Aldine, 1964(65), pp. 123-136 (128).

**Everett Lee, op. cit. Also Henry Shryock, Jr., Population Mobility with the United States, University of Chicago, 1964. James Beshers, Population Processes in Social Systems, The Free Press, 1967, esp. p. 146.

FIGURE 26



PERCENT OF NATIVE POPULATION BORN IN STATE OTHER THAN STATE OF RESIDENCE, FOR CONTERMINOUS UNITED STATES: 1900 TO 1960

DEPARTMENT OF COMMERCE BUREAU OF THE CENSUS

Bureau of the Census, 1960 Census of Population, op. cit., p. S-42, Figure 62.

FIGURE 27

MOBILITY STATUS (DIFFERENT COUNTY)

	MOBILE (1000'S)	PER CENT MOBILE
1947-1948	9,008	6.3%
1956-1957	10,262	6.3%
1960-1961	11,246	6.2%
1965-1966	12,538	6.5%

Bureau of the Census, Historical Statistics of the United States, and "Continuation to 1962," C-80-88, and Statistical Abstract, 1967, p. 34, Table 34.

In a recent study of movement between SMSA's, Ira Lowry has pointed out that nearly all variance in movement could be explained by the difference in the employment attractiveness of the destination.* Thus, less unemployment and higher wages were the primary causes of in-migration. But this cannot be the whole explanation. A recent study by the National Planning Association points to the fact that the North Central region has a higher than national per capita income and is yet an area of net out-migration.** Relatively low cultural attractiveness and the worst climate in the nation by most people's standards may well account for this anomaly.

As mentioned above, SMSA's with high rates of net in-migration also have very high out-migration rates.*** Thus, the difference between California and West Virginia is not that the West Virginians are leaving faster than the Californians, but that the effectiveness of out-migration is less than zero in California and quite high in West Virginia. Thus, the Negroes have not been moving relatively rapidly out of the South, but they have had a relatively much greater disinclination than whites to move back into the South.

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*Ira Lowry, Migration and Metropolitan Growth: Two Analytic Models, Chandler, 1966.

**Looking Ahead, June, 1967, pp. 4 ff.

***Ira Lowry, op. cit.

One of the chief sources of significant or "effective" migration[*] has been the movement off of the farm. This has been going on since 1800, and especially since the civil war. Figure 28 shows that surprisingly this movement shows little sign of abating. Yet Figure 28 also demonstrates that in another 20 years this aspect of our migration patterns must change from one of great significance to insignificance.

IIa. Speculative Suggestions on the Application of Segmented Analysis to Future Patterns of Mobility and Distribution

While projecting fertility can be conceived as a one-stage problem, projecting population movement can be broken down into a two-stage process. Thus, we are interested in fertility *per se*, while we are interested not primarily in mobility but in mobility *and* direction. The first stage can be conceived in a manner analogous to that suggested above in section Ia for fertility. A standard segmentation approach would look again at variations in mobility by educational level. Figure 29 suggests the approximate levels of education for the most mobile age group in the population twenty years from now. Students of mobility claim that education is closely related to mobility. If, for example, mobility of those with educational levels 0-11 was half of that for those with 16 or more years of school,[**] then one might project about a ten percent increase in mobility by 1975. Yet the observation that mobility has been fairly stable since 1958 during a period of rising educational levels must be explained away.

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[*] Cf. Shryock, *op. cit.*, pp. 287 ff.

[**] For example, Everett Lee, *op. cit.*, esp. p. 129.

FIGURE 28

NET MIGRATION FARM TO CITY (1000'S)

	FARM POPULATION	NET MIGRANTS	BIRTHS/DEATHS
1920	32,000		
1956	18,712	- 627	261
1957	17,656	-1295	239
1958	17,128	- 748	220
1959	16,592	- 740	203
1960	15,635	-1142	184
1961	14,803	-1000	168
1962	14,313	- 646	156
1963	13,367	-1086	140
1964	12,954	- 533	121
1965	12,363	- 703	112
1966	11,595	- 853	90

Statistical Abstract, 1967, p. 605, Table 892.

FIGURE 29

EDUCATIONAL ATTAINMENT

MALES 20-35 (ESTIMATES)

YEARS OF SCHOOL	1965	1985
0-7	5%	1%
8-11	25%	15%
12-15	56%	52%
16 +	14%	32%

Estimated from Statistical Abstract, 1967, P. 116, No. 158, and PP. 111-116.

Figure 30 attempts to carry this speculative exercise further by suggesting that we look at characteristic mobility subgroups, and examine projections of their size in the future population. While there is a great deal of motion, some groups participate in this to a much greater extent than others. Again a great deal of evidence should be brought together to estimate the size and mobility behavior of these groups. I have only used the references cited above to gain some feeling for what a properly researched table might look like. The "immobile middle class" is the group bound by property and tradition to their local communities. New England, for example, has had relatively low mobility rates in the past, and probably contains a higher percentage of this group. The "immobile lower and working class" group is bound by ties of family and tradition and ignorance more than by property. These are the people who balance the "footloose" lower and middle class mentioned below. They keep over-all lower class mobility below middle class levels in spite of the latter. Both of these groups will decline in size with the increasing breakdown of traditional attitudes and loyalties. In labeling group (3) the "migrant lower and working class" I have used the word "migrant" in the special sense of a group moving with fairly high effectiveness from one place or type of life to another. Most of the farm to city motion has been in this group. As suggested above, most of this movement should decline rapidly by 1985 as the sources of this mobility are used up. The "fluid lower and working class" consists of migratory workers, construction teams for dams, bridges, etc., and other subgroups which have become accustomed to life in motion, but do not have the standards of life of group (6). These are the trailer and shanty people. The "migrant middle class" is that group of people looking for a better way of life, but not for a life

FIGURE 30

MOBILITY BY MOBILITY SUBCULTURE

		CLASS RATE	% 1965 POPULATION	% 1985 POPULATION
1.	IMMOBILE MIDDLE CLASS	4.0	15%	10%
2.	IMMOBILE LOWER AND WORKING CLASS	2.5	38%	25%
3.	MIGRANT LOWER AND WORKING CLASS	8.0	15%	8%
4.	FLUID LOWER AND WORKING CLASS	15.0	10%	5%
5.	MIGRANT MIDDLE CLASS			
	(LIFE AND JOB)	8.0	10%	17%
	(RESORT)	10.0	2%	5%
6.	FLUID UPPER MIDDLE CLASS	12.0	10%	30%
	OVER-ALL RATES		6.5	7.9

on the move. (Of course, in fact once a person moves there may be a greater chance he will move again.) The first subgroup contains persons in their working years. They are looking for a location with good job or business prospects, but with a better climate, or better "way of life" as well. A still small subgroup here consists of their older generation class fellows who plan to move to a retirement area. The "fluid middle class" (6) is the upper middle class "professional" class with college or more education. Men here may look on the whole nation as one job market, or they may work for a large corporation with several different facilities scattered about the country.

If one decided that the mobility rates assigned to the classes in 1965 were correct and stable, and that the classes would change as suggested, then Figure 30 suggests there would be something like a 20% change in mobility rates.

But the foregoing exercise appears to tell us little about destination. There could be more mobility but zero effectiveness. In fact, it can be shown that unless we change the direction and rate of net migration flows between 1940 and 1960 in our projections of the future we will run up against a limit imposed by the relative size of the out-migration and in-migration populations. This would be sooner if as suggested in Part I population growth follows Bureau of the Census projection (D) rather than (B).

In order to determine the direction of net migration in the future we would need to rely on technological forecasting which could relate prospective technological change to impact upon the economic subregions of the United States.* But the foregoing discussion of future mobility subgroups should also help us here. Thus, while the migrant middle class will continue to

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*Using such works as Donald Bogue and Calvin Beale, Economic Areas of the United States, Free Press, 1961 and Walter Isard, Methods of Regional Analysis, M.I.T. Press, 1960.

move from areas of impoverished culture and poor climate to what they feel is a better way of life, probably in the South and West, the "fluid upper middle classes" and the first four classes will be responding to more purely economic motivations. Again it can be seen how the more complex segmentation theoretically should allow a more meaningful projection of future migration trends.

III. Final Note

We have discussed some standard information on future projections, but have interjected some new or different ways of looking at these projections or directing new research in this area. Here I wish only to add two points about projecting which are of particular relevance to the projection of educational needs and of the future distribution and quality of life in the United States.

First, the planner should consider what are the relative gains and losses of making errors in over- or underestimating the future population of the nation or of some subdivision of it. Frequently planning should be conservative in the sense of slight overestimation. If the (D) projection is most likely, perhaps C should be taken as a basis for planning in many areas. Secondly, and closely related to this fact, is the consideration that future needs are often not as closely related to future population as are changes in the demand patterns. Anyone who predicted 1968 health needs in 1958 on the basis of 1958 use of medical services per person would have been more in error from failure to predict the increases and changes in social services, income, hospital versus office treatment, etc., than he would have fallen into errors stemming from projecting the gross populations in 1968. This may also be true in many fields of education. This is not the case for all aspects of the problem of educational projections. For example, nearly 100% attendance today implies that many future educational requirements will be quite directly responsive to the size of future age-groups.

HI-1043-RR

PART THREE

EDUCATION AND ANTI-POVERTY MEASURES

By

Raymond D. Gastil

TABLE OF CONTENTS

Page

Preface. 3-iii

A. The Poverty Subculture 3-1

1. The Concept of a Poverty Subculture 3-1
2. Describing the Culture of Poverty and Its Carriers. . . . 3-6
3. How Stable Is the Culture of Poverty? 3-17

Note to Section A: Should Cultures of Poverty Be Preserved?. 3-27

B. Means of Increasing Movement Out of the Culture of Poverty . . 3-33

1. Introduction. 3-33
2. The Possible Cost of Financing Mass Movement Out of the Poverty Subculture Through Training 3-37
3. A Training and Relocation Program to Activate the Poor. . 3-48
    - a. Recruitment, Motivation and Discipline 3-51
    - b. Training Camps 3-53
    - c. On-The-Job Training. 3-56
    - d. Relocation and Housing 3-57
    - e. Cost of the Program. 3-59
4. Integration for Equality of Educational Opportunity . . . 3-62
5. Some Alternative Considerations in Judging Training Programs. 3-71
    - a. The Effectiveness of Training the Already Educated Upon the Opportunities of the Lowest 20% 3-71
    - b. The Relative Effectiveness of General over Technical Education in a Rapidly Changing Society. 3-73
    - c. The Possibility of Character Education 3-74
    - d. Paternalism in Career Development as a Positive Mode of Education. 3-75
    - e. The Double Effect of Adult Education, Training and Placement. 3-76
6. A Suggested Direction of Penal Reform 3-77

ANNEX (i). A Critique of the Proposed School Desegregation of New York City. 3-83

Note 1. Motivation for Education of Lower-Class Parents 3-100

Note 2. A Discussion of Some of the Dangers Arising from Neighborhood Control of the Schools in New York City. 3-102

TABLE OF CONTENTS (Continued)

Page

ANNEX (i). (Continued)

Note 3. The Possibility of School Decentralization Triggering a Much More General Decentralization of City Government. 3-109
Note 4. General Remarks on Solutions of Inequality Through Segregation 3-112

ANNEX (ii). Character Training in General Education. 3-117

Basic Problems in Evaluating Educational Systems . . . 3-117

The Loss of Boundaries in Liberal Society. 3-124

The Development of Character Through General Education 3-127

PREFACE

Perhaps the most urgent question facing education today is the question of educating the poor for equality. If this is purely a technical question of providing training in certain skills, of providing better teachers or longer hours, then the subject is largely one of economics. If technical training is not sufficient to attain equality, it may be because there are not sufficient jobs even for the trained (in some cases because of job discrimination), or because poverty itself develops attitudes of mind and modes of behavior which inhibit productivity. The solutions then become more complicated, but remain basically simple. The job market can be expanded, perhaps artificially, and the poor can be given a guaranteed income level sufficient to change their mode of thought and behavior.

We believe that the answers suggested above would be sufficient for equalizing the opportunity of many of the poor (although they might cause other problems for other persons). However, we feel that most of the poor with children suffer from cultural disabilities considerably more serious than current approaches suggest. Most of the poor are bringing up their children in a particular educational tradition that may be called the poverty subculture. We realize that a good many people concerned with poverty have claimed that there is no such thing as a "culture of poverty," but rather only general reactions of poor people to certain formal educational and economic disabilities. Much of their evidence is based upon polling and the examination of social welfare records and statistics. Nevertheless, we feel this critique of the poverty subculture concept is not sufficiently convincing. It goes against both the common knowledge of many employers and others working with the poor in this country and overseas, and against the evidence of innumerable community and class studies by social scientists over the last century.*

Viewing poverty and equality this way, we have come also to see education in its broadest terms as the process of enforcing or retarding cultural change, bringing groups together or separating them out. Taking this approach, we have developed a number of alternative suggestions as to how the educational experiences of the poor might be changed through a variety of means ranging from integration to training to penal reform. In some cases we have suggested what might be the magnitude of the effort and the expected returns of alternative programs.

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*For a fuller explication of this argument see R.D. Gastil, "Toward a New Basis for the Evaluation of Anti-Poverty Programs," Report II, in A.J. Wiener, ed., The Future of American Poverty: Some Basic Issues in Evaluating Alternative Anti-Poverty Measures, HI-1006-RR, Hudson Institute, Croton-on-Hudson, N.Y., April 15, 1968. Much of this paper is based upon portions of HI-1006-RR, prepared for the Office of Economic Opportunity.

A. THE POVERTY SUBCULTURE[*]

1. The Concept of a Poverty Subculture

There has been a wide currency to the phrase "culture of poverty," but the shared term masks some quite different views about the things to which it refers, and hence different implications regarding their significance for the education of the poor. The different viewpoints start from the common observation that there is a pattern of attitudes, beliefs, values and behavioral styles that is frequently to be observed among the poor. It is to this "culture of poverty" that the middle-class American may frequently be responding in judging whether an individual is poor. But from that observation of a common culture among the poor, the analyses diverge sharply. From the sociologist's point of view, there is debate about whether this is a genuine and autonomous sub-culture most of whose members are poor, or whether the "culture" is simply a pattern of defenses and adaptions to the economic and social facts of not having money. For public policy, the key issue is whether a change in the "culture of poverty" is a _prerequisite_ to eradicating poverty, or would be a _consequence_ of eradicating poverty, and in particular how the "poverty culture" would be affected by externally induced changes in income--or how the "culture" might affect such measures.

(a) _Poverty as an autonomous culture_. Under this view, the group should more properly be called "the lower class" rather than "the poor." They may be considered a sort of ethnic minority, with a distinctive culture, just as subcultures are distinguished on other ethnic bases within the U.S., or within other countries. The argument that aspects of traditional culture have marked consequences for achievement and entrepreneurship is old, spanning both Tawney's analysis of the interactions of Protestantism and enterprise in the development of European commerce, or McClelland's more recent work on

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[*] Parts of this section were contributed by Paul C. Berry.

"need for achievement" in both ancient and contemporary cultures. Applied to the U.S. poor, it may be argued that they exhibit some traits that directly impair their productivity or effectiveness in the U.S. economy, some characteristics which are especially relevant to income include lack of ambition, lack of planning for the future, small regard for the investment in education, a skill, or the capital goods that it would take to get ahead, and/or excessive family size. These, of course, are not the _only_ attributes of this subculture, but those that are of direct concern to antipoverty programs.

(b) _Poverty as an autonomous and equal culture_.* A subdivision of those viewing the poor as a sort of ethnic tradition adds the further remark that this is a distinct _and equally valuable_ culture. This may be either part of a more general philosophy of cultural relativism, or a specific evaluation of the culture of poverty. The cultural relativist decries judgment of the culture of the poor by members of the middle class, who mainly see it as defective because of its departures from their own middle class cultural traditions. While agreeing that the poor may have a _different_ culture, they insist on the "right" of the lower class to have such a culture, and the equivalent worth of the culture. Riessman perceives important strengths in the folkways (culture) of the poor, and believes that social institutions serving the poor should be adopted to that culture rather than the reverse. Some (e.g. Paul Goodman) claim to find the culture of the poor admirable in some ways even to their middle-class intellectual tastes.* The view is shared to some extent by what one might call "nationalist" movements that have many members who are poor, especially Negro nationalist groups like SNCC or MFDP. The Black Muslims, on the other hand, have values which appear severely middle class despite their ideological appeal to the lower class Negro.

The issue of cultural style is repeatedly raised by observers of the interaction in public schools between middle class teachers and lower class children; Havighurst, Deutsch, and others have viewed some of the problems of schools in lower class areas as arising from the different expectations, values, experiences and communication styles of the two groups.

(c) Lower-class culture as a cue to discrimination. Another view, different from the first two but not incompatable, interprets the poor achievement of lower class persons as the result not so much of their own inadequacies, but as discrimination against them by a middle class that disapproves of other aspects of their culture. It seems undeniable that some elements of such a process exist, although just how important it is in comparison with the other effects may be debatable. In social situations, it appears that class membership is sometimes a more important cue to discrimination than such perennial discriminators as race. The issue has also been raised regarding the (presumably more inadvertent) effects of class bias in measures of intelligence, school achievement, and personnel selection. Correcting such biases might be of some use, regardless of one's view about whether the poor are "entitled" to a culture of their own or not, or of what its comparative cultural worth may be.

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*Goodman, and also Edgar Friedenberg, refer with some admiration to the freer and more honest expression of such themes as sexuality and aggression among lower class youth. However, the claim of a less inhibited or less neurotic sexuality often is not substantiated by those who have specifically studied the sex roles and relations of the poor (e.g. Rainwater).

(d) Poverty as a stable, evolving culture. The origin of the "culture of poverty" is another item of disagreement. It may be seen as the product of a long historical evolution of the lower class in Europe and also the former slave population, or it may be seen as a more transitory response to or defense against the specific economic circumstances in which poor people find themselves. The famous Moynihan report* revived the view that many of the distinctive cultural traits of the lower class Negro population (which act as barriers to their economic and social advancement) are the products of the particular North American form of the institution of slavery, which produced the cultural deformation thought to characterize the Negro masses. Others have seen African elements in the U.S. and Caribbean Negro cultures. Or the culture may be thought to arise much more generally in the experience of lower-class rural persons undergoing rapid urbanization. Many of the patterns that Moynihan attributed to the specific features of American Negro slavery seem to occur frequently and reliably in the depressed segments of other populations of quite different ethnic background and history--for instance, among various American Indian groups, or the hinterland Acadians of the Maritime Provinces studied by the Leighton group,** or the Mexicans studied by Oscar Lewis.***

(e) Poverty culture as a transitory defense. This view conceives of most of the traits of the poor that constitute their culture as the parallel responses of individuals to discouraging or even hopeless economic circumstances.

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*U.S. Department of Labor, The Negro Family, Washington: GPO, 1966.

**Charles C. Hughes, et. al., People of Cove and Woodlot, New York: Basic Books, 1960.

***Oscar Lewis, The Children of Sanchez: Autobiography of a Mexican Family, New York: Random House, 1961.

The marked parallel between some cultural features of American Indians on reservations, Negroes both in rural and urban areas, and whites in depressed areas are thus seen as responses to parallel economic circumstances, rather than as parts of a single (or several parallel) autonomous traditions. The "culture of poverty" is recreated in each individual as the consequence of his encounters with inadequate resources and with the social roles and social environment imposed by low income and the difficulties attendant on it. If the cultural style is a response to economic privation, we presume that it will disappear as that privation is eliminated. It might still be that adults who have lived since childhood in such an environment would be slow to respond to changed circumstances, but certainly one would suppose (taking this view) that the next generation would show little sign of the culture if its principal cause had been removed. The transition from the poor to the new lower-middle class--or to the nouveau riche--has often been noted, but mostly in cases in which those who were upwardly mobile really rose by their own efforts rather than by external largesse--or at least were able to maintain that delusion even if their success was largely adventitious.

These different views about whether there is a "culture of poverty," of what it consists, how it arose, how it is perpetuated, and what part it plays in the problem of poverty are not mutually exclusive, and the same individual may share elements of several. Nor are they directly translated into alternative views of antipoverty policy. But they will be evident in the following formulation of questions regarding policy.

Dispute about the worth or origin of a "culture of poverty" may mean little to an educational administrator unless the disputes have some bearing on educational measures. In order to design educational (or other) measures which operate directly through or on the culture of poverty or which take effective account of it, the following questions may be important:

1. How many of those poor today actually exhibit the "culture of poverty" syndromes, and what are the essential features of this "culture"?

2. How stable is the culture of poverty? Is its continuation simply a consequence of economic privation, so that it would be rapidly dissipated if the poor had jobs, money, etc., or should it be expected to persist even after correction of the economic bases of poverty?

3. What means exist by which the culture of poverty traits might be modified? Should such modification be aimed at traits of direct economic significance (productivity, achievement, planning family size) or at secondary traits which serve to identify the poor and make them subjects of discrimination?

4. Would it be useful to improve inter-class attitudes and communication? Would it be useful to attempt to influence the attitudes of the middle class towards the "culture of poverty" (rather than or in addition to directly operating on the poverty culture), or to prevent discrimination against persons because of class traits?

5. Would a change in this culture be sufficient to shift the poor out of their poverty? What means might be employed to produce this shift? At what rate would people leave poverty?

6. Is a change in the culture of poverty necessary if people are to escape poverty? Does failure to alter the "culture of poverty" impair the effectiveness of other types of antipoverty measures?

2. Describing the Culture of Poverty and Its Carriers

The answer will depend upon definitions and criteria. In order to arrive at quantitative estimates, it will be necessary to explore the qualitative nature of this culture in greater detail, and distinguish a number of different categories. Let us begin by using the rather simple dichotomy common to the previous generation of social scientists:

Middle and Lower Classes[*]

	U.S. Middle Class	U.S. Lower Class
	Economic and Social Status	
a.	i. Relative economic security.	i. Harassed by insecurity.
	ii. Recognition in wider community.	ii. Only local recognition.
	iii. Schools and community organizations have goals in accordance with wished of average middle class family.	iii. Not true, lower class children are discriminated against.
b.	i. Specific Goals Relating to Property.	
	1) Stress on permanency of property and piling up capital goods.	1) Keeping family fed, clothed and housed vital.
	2) Emphasis on thrift and hard work.	2) Immediate spending of money and goods.
	3) Respect for property and ownership.	3) Little respect.
	ii. Specific Goals Relating to "Good Standing"	
	1) Strict sex taboos.	1) Prowess in sex encouraged.
	2) Emotional control, especially of aggression.	2) Prowess in aggressive techniques gives prestige.
	3) Good fellow in a respectable job and not too different.	3) Good fellow in gang.

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[*] Clyde Kluckhohn, and Florence Kluckhohn, "American Culture: Generalized Orientations" in Conflicts of Power in Modern Culture, New York, Harper, 1947, pp. 106-129. The middle class-lower class distinction is that preserved in Robin Williams American Society, 2nd ed. and other standard sources.

U.S. Middle Class	U.S. Lower Class
4) Cleanliness.	4) Not stressed, perhaps because the mother usually works and has little time for cleanliness.
5) Respect for law and order.	5) Opportunistic attitude toward law and order.
6) Good manners of conventional kind.	6) Less attention.
7) Affiliation with proper companies and organizations.	7) Not so affiliated.
8) "Good works" stressed, but may increase class sense.	8) Not stressed.
iii. Individual autonomy stressed.	iii. Not stressed or unstressed.
iv. Good education, especially as it relates to success, stressed.	iv. Vague idea education helps success, but "too educated" a misfit.
v. Good marriage, ideally no divorce.	v. Marriage and divorce not very important.
vi. Relation to Family Solidarity	
1) Isolated conjugal unit.	1) Extended family, conjugal unit may not be too important.
2) Undesirable relative disregarded	2) All relatives recognized.
3) Spheres of dominance separate: father in finance, mother directs social life of father and children and self.	3) Father often marginal, maternal dominance by working mother.
4) Child-centered, hope of future status through children.	4) Not child-centered, children not closely watched.
vii. Relation to Recreation	
1) Participation in individualistic and organized sports desirable.	1) Little attention paid.
2) Frequent travel for vacations.	2) No.

U.S. Middle Class	U.S. Lower Class
3) Commercial entertainment important.	3) Gambling and commercial entertainment important from early age.

Patterns of Training Children

a.	i. Encouraged to save, have a bank account, accumulate things, to have organized hobbies.	i. Stress on getting a job early, early financial responsibility.
b.	Training for good standing	
	i. Early taboo on sexual matters, little chance to learn, but now some formal learning.	i. Relatively few sexual taboos.
	ii. Emphasis on washing hands, clean clothes, regular bowel movements, order and neatness.	ii. Little emphasis on these matters.
	iii. Emotional Control	
	1) Control of aggression: do not hit if you are bigger, do not hit unless other attacks.	1) Children encourage each other to fight.
	2) Control temper.	2) Overt aggression expressed in family.
	3) Achievement important, but not overt expression of pride.	3) Achievement not as important (at least in middle class terms).
	4) Conformance to the rules of the game. The child is taught to pay attention to the approval of others.	4) Neither emphasized by parents.
	5) Careful training in table manners, proper forms of letters, etc.	5) No.
	6) Taboo on undesirable playmates, not to speak to strangers; accepted patterns of entertaining friends, children's organizations.	6) Child on his own, collects his own companions.

	U.S. Middle Class	U.S. Lower Class
	7) Respect for policemen and other authority figures taught.	7) "Do it and try not to get caught," fear rather than respect of authorities.
c.	i. Ownership is stressed; child is taught to say: "This is mine, that is yours."	i. Not stressed.
d.	i. Interest in school grades inculcated.	i. Parents take no daily interest in the education of the children. Little attention is paid to home study and long-term educational goals.
e.	i. Child respects parents as main authority, not grandparents; discrimination among relatives out of concern for family status.	i. General recognition of extended relatives, may live with them for long periods, children care for each other.
f.	Patterns Relating to Recreation	
	i. Specific supervised training, organized with rules.	i. Children spend money on recreation as they please, when they have it.
	ii. Parents take children on trips.	ii. They do not.
	iii. Supervision of commercial recreation where the "good" and "bad" definitely distinguished, e.g., the beer parlor is condemned.	iii. Not supervised.
g.	Reward and Punishment.	
	i. Threat of withdrawal of love.	i. Physical punishment, frequently inconsistent.
	ii. Threat of deprivation of a pleasure or thing.	ii. Not very meaningful.
	iii. Offer of pleasure, thing, or praise as a reward.	iii. Frequent lack of ability of parents to give or lack of faith of children that it will be given.
	iv. Long term reward and punishment.	iv. Short term.

U.S. Middle Class	U.S. Lower Class
v. Child may in later life depend on mother's approval for social action.	v. Usually not an enduring stimulus to social action.

But as the Kluckhohns realized then and would even more today, the situation is considerably more complex. Let us define the following subcultures relevant to our interest, all of which may contain "poor" persons by the definitions of Orshansky.

A. New Middle Class*

B. Old Middle Class*

C. Working Class*

D. Lower Class

  1. Incipient Risers*

  2. Rejecters

E. Enclaved Working and Lower Class Groups.

The middle class culture described in the foregoing table is, of course, the Old Middle Class. It is religious, has high sexual standards, emphasizes thrift and hard work. The New Middle Class culture, however, emphasizes consumption, enjoyment, the breaking down of constraints. It attempts to base society on the standards which in past centuries were more appropriate to the frivolous upper classes.

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*Failure to make these distinctions, already foreshadowed by the Kluckhohns, led to some productive criticism of the simple dichotomy by S.M. Miller, Frank Riesman and Arthur A. Seagull, "Poverty and Self-Indulgence: A Critique of the Non-Deferred Gratification Pattern," in Louis Ferman, Joyce Kornbluh and Alan Haber, Poverty in America, University of Michigan, 1965, pp. 285-302.

The Working Class* culture provides dominant guide lines for perhaps the largest single group of Americans. The standards of this group are midway between the incipient risers of the lower classes and the old middle class. Members emphasize a wide circle of family connections or neighborhood friends, and the life lived within this framework is the important life. Work is sought through family connections. Jobs are judged by the pay, and education by the payoff. But these are not strivers. Within the family the position of the father is often quite strong.

The Lower Class** culture of rejecters is the one described in the table. By "rejection" I mean the rejection of old middle class or working class standards and values. By contrast, when the women and the older siblings accept old middle class, or at least working class, values and standards, then sexual permissiveness, the inability to delay gratification and certain other patterns of thought often associated with lower class culture will not be present. However, the frequent weakness of the man's position is common to both types of lower class family. The male society is that of the streets or taverns, the female society is either that of the prostitutes and alcoholics for rejecter families, or that of women oriented toward a more respectable past, or toward escape, at least for the children, in the incipient riser group.

Subcultures A-D must be defined on a sliding scale of behavior, attitudes and sophistication which goes beyond the standards of the family and includes a large component of sheer economic possibility. One can be marginally poor as the result of special circumstances and not be lower class; one can be above the poverty level and be lower class; but both conditions are hard to maintain (in our later discussion we exclude the "wealthy" lower class and the poor working and middle classes from our focus). The reference tradition for all groups is still to a great extent the old middle class tradition. But a stable migrant labor family of husband, wife and two children with habits of thrift, and interest in the education of their children appropriate to the old middle class, for some purposes might still be categorized as lower class incipient risers in spite of the many middle class features of their life.* First, they would not be accepted as middle class by any middle class group, and secondly their children grow up in lower class surroundings, filled with behavior models which are not at all the middle class patterns their parents hope for them.

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*The distinction of lower and working class is that used by Herbert Gans, (in Ferman, Kornbluh and Haber, pp. 302-311), although I have expanded the concept of working class to include many non-striving consumption oriented people with less exacting standards of cleanliness, aesthetics and behavior than the middle class.

**For example, as described in Walter B. Miller, "Focal Concerns of Lower Class Culture," in Ferman, Kornbluh and Haber, op. cit., especially p. 262.

Finally, there are groups of people which include those classed as poor for which the foregoing categories are less meaningful. Generally having value systems close to the working class culture these people are the inheritors of relatively intact American Indian traditions, or old world conservative religious traditions, such as the Hutterite. I have classified such groups as enclaved working and lower class groups, where "class" is used to refer to economic standing more than to other cultural attributes.

Cultural differences among classes lead to prejudices which keep down the poor. But many of these prejudices relate to real experiences with the poor, experiences the poor often admit.* In speaking of the Indians of British Columbia, a recent study points out that there is in fact little discrimination against Indians by employers which is not based on experience: they do indeed tend to be tardy, often absent, careless with property, and quit readily.** Thus, many of the poor, the bearers of the culture of poverty, of lower class culture, are not very productive, and their culture adds to their low formal education to keep their productivity down. If one believes--as the lower classes often seem to do--that the differences between the levels of success of individuals in life are due primarily to luck, or that success is due to sharp dealing more than to intelligent effort, or that the choice is between freedom from any constraint and dependency under strong authority, then attitudes toward work will suffer. It seems reasonable to suppose that apparent irresponsibility comes from attitudes and beliefs such as these. If an individual's parents and/or associates place a very low value on education, and leave school early, then the chances are that the individual will also quit school before he should.

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*There are of course many middle class aspirants in lower class contexts. For family planning behavior compare Lee Rainwater, And the Poor Get Children, 1960, p. 31, and R. Freedman, P. Whelpton, and A. Campbell, Family Planning, Sterility and Population Control, 1959, pp. 129-132.

Identity and Numbers. But who belongs to the lower class pattern, particularly to the rejecter group? Many of the traits here ascribed to lower class culture are often described as particularly characteristic of reservation Indians, of lower class American Negroes or of poor Mexicans.[*] While the origins of the traditions of the poor lower class in America are certainly diverse and have been explained in diverse ways--for example, the origin of Negro matriarchy in the slavery system or West African culture--the fact is that a child being brought up in a big city Negro Slum, an Okie shanty town, or the former Klamath Indian reservation in Oregon is apt to be surrounded by a matriarchal situation in fact, if not theory; often to be cared for by grandparents or other relatives; and the boy will find few male models which it is socially desirable for him to copy.

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*Cf., e.g. the discussion of the economic position of the Sioux by Wesley R. Hurt, Jr., "The Urbanization of the Yankton Indians," Human Organization, Winter 1961-62, p. 227.

**H.B. Hawthorn, C.S. Belshaw, and S.M. Jamieson, The Indians of British Columbia: A Study of Contemporary Social Adjustment, University of California, 1958, pp. 73-74. Meriam warned of this result for American Indians in 1928. See Louis Meriam (Tech. Dir.), The Problem of Indian Administration, Institute for Government Research, Johns Hopkins, 1928.

How many of the present poor are, then, blocked from greater productivity in their past or present life by the culture of poverty in which they grew up? Orshansky estimated that in 1963 there were 7.2 million poor *families*. Of these, 5 million families were headed by a male, and 2.2 million families were headed by a female. Out of the 5 million male family heads, 35% worked full time, all year. Another 25% couldn't work because of illness and old age. That means that 60% of the male-headed families evidently could *not* be made up predominantly of lower class persons, at least by this restricted criterion. If we assume that of those with part-time employment or some record of unemployment in 1963, a fourth were honestly trying to be responsible males, that leaves only 30% of male-headed families which meet this criterion for membership in the "hard core" lower class.

Neither should we imagine that all of the families headed by females are lower class. Here we have less data: perhaps we can reasonably assume that one-fourth are not.

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[*] Cf. John Dollard, *Caste and Class in a Southern Town*, Robert Bennett and Gottfried Lang in *American Indians and Their Economic Development*, (Fred Voget (ed.) *Human Organization*, Winter 1961-1962.) Evon Vogt, *Modern Homesteaders*, Cambridge, Massachusetts, 1955. Oscar Lewis, *Five Families*.

These considerations suggest that of the 7.2 million poor families* perhaps not more than 3 million are "lower class-rejecters." This estimate needs revision to allow for those we would judge to share a hard-core "culture of poverty" but who were missed in our first single-test approximation. Let us therefore arbitrarily add 500,000 families who exhibit a poverty culture by virtue of economics and surroundings, if not by familial behavior.

While this 3.5 million families are fewer than half the poor families, they will nevertheless include the majority of the 29.7 million poor individuals in families***

Of the 5.0 million unrelated poor, half are 65 or over. From the employment record it would not appear that more than 50% of the unrelated poor are part of the poverty culture in terms of motivations and attitudes. This gives us an estimate of only 15-20 million individuals in the "hard core lower class." These represent about 3.5 million families, plus another 2.5 million unrelated individuals.

Demography of the Culture of Poverty. Where are and who are these poor? Many will be found in Puerto Rican and Negro slums, or among the .4 million Spanish-American poor in the Southwest, or the .2 million American Indian poor, or the .38 million migrant workers and their families.

Members of the lower class are often those without formal education; their culture rejects its values and goals, and the circumstances that prevent schooling are also those that produce poverty--as well as the direct effects of education or earning power. Two-thirds of the poor live in families whose head left school before the eighth grade.*

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*Table 18 of Orshansky.

**Table 5 of Orshansky.

***A slightly fuller explanation of these figures may be found in R.D. Gastil, "Toward a New Basis for the Evaluation of Anti-Poverty Programs," Report II, in HI-1006-RR, op. cit.

A large number of the individuals who are poor today are children. This arises because of the higher frequency of large families among the poor. An especially large number of children are concentrated in these hard-core lower class segments.

If we assume that a great many of the children in all of these groups are growing up in the "culture of poverty," and that this differential also existed in the past, it seems likely that the cultural pattern will persist unless important new external forces alter the conditions that perpetuate this culture.

3. How Stable is the Culture of Poverty?

It has been estimated that there were 35,000,000 poor people in 1963, of whom 15,000,000 were children in poor families. Thus, while 18.5% of all people in the U.S. were poor in Orshansky's definition, 22% of American children lived in poor families. Some of these families were only accidentally poor in 1963; in other years they do better. Some of these families were in a middle or working class cultural environment, in spite of the poverty of the family. But one imagines also that some lower class families had a good year in 1963, and thus were temporarily "above" their expected condition in economic terms and have not been counted. Although this latter effect must partially offset the previous qualifications, our calculations in the preceding section suggest that about 3.5 million families should be classified as lower class and characterized by what is rather loosely called a culture of poverty. These families contain fifteen million persons.

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*These estimates are from Ferman, Kornbluh and Haber, op. cit., pp. 85, 105-106.

In order to examine the dynamics of the lower class, let us first find out how many children are involved, and the estimate of their prospects of remaining in that class. If the figures above are correct, we may estimate the residual number of children if we first subtract 5.5 million family heads (4 million adults in husband-wife families and 1.5 million women in female led families) from the 15 million. In addition, one might estimate that another 500,000 adults in these families should be subtracted (e.g. children 18 or over, or aged relatives who are part of families, or other unmarried adults in the family). This means that there may have been 9 million children growing up in lower class cultural contexts in 1963.

The question now becomes: how many of these 9 million children should we expect to grow up to repeat the pattern of low productivity in the next generation? How many could ordinarily be expected to rise out of the lower class and out of the poverty culture? Since only indirect evidence is available, we shall attempt some rough estimates by a series of approximate calculations that they may at best serve to give some impression of the order of magnitude of rates of change between classes

The classic study by Morgan et al * compares the education of the heads of families that are poor** today with the education that their fathers received. This comparison is presented in the following table.

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*James N. Morgan, Martin H. David, Wilbur J. Cohen, Harvey E. Brazer, Income and Welfare in the United States, New York: McGraw-Hill Book Company, Inc., 1962.

**Using their rather high definition of the dividing line between poor and non-poor.

Education of Family Heads and Their Fathers[*]

	Grade School or Less	Some High School	Beyond High School
Present heads of poor families	64%	17%	19%
Present heads of nonpoor families	22%	22%	56%
Fathers of heads of families now poor		66%	34%
Fathers of heads of families not now poor		63%	37%

It appears that the differential in education of the grandfathers of poor families is nowhere near as marked as it is for the heads of poor families. Presumably some well educated persons of the last generation had children who nevertheless became the heads of poor families, while many poor fathers in the last generation had children who became heads of families that were not poor today.

Morgan *et al* compared the educational attainment of the poor with that of the rest of the population as follows:

Education Attained by Children Finished with School[**]

	0-8 grades	9-11 grades	12 or more
Children of Poor Families	34%	21%	45%
Children of Not-Poor Families	7%	21%	72%

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[*] Adapted from the table appearing on p. 207 of Morgan *et al*., *op*. *cit*.

[**] Adapted from the table appearing on p. 211, *ibid*.

These data understate the likely final attainment of children from these families since the children still in school are not counted. Making some allowance for that fact, and rounding off, let us provisionally assume that the educational attainment of children of poor families in this decade approximates 30% finishing no more than 8 grades, 20% having some high school but not finishing, and 50% completing high school. What are the expectations of this group of remaining in poverty?

Morgan's data indicated that about 20% of poor families were headed by high school graduates. If we apply that same figure as a basis for estimating the number of poor children who graduate from high school but do not thereby escape poverty, then 80% of the 50% of the poor who graduate would be out of poverty. If so, then 40% of the children of the poor should escape poverty.

Let us now return to the estimates of the size of the lower-class group and attempt to guess the possible size of the education effect upon the lower-class poor. Assume that 6 million of the children in poor families are not in lower class families.* If we assume that for these 6 million, 70% will achieve a high school education or better,** then there would be 3.6 million non-lower class poor receiving high school or better training. Returning to our estimate that among the poor group taken as a whole 50% will graduate from high school, that would be a total of 7.5 million poor children receiving this level of education. Subtracting the 4.2 million graduates who are not lower class, 3.9 million high school graduates remain who are both lower class and poor. If this results in exit from poverty for 75-80% of them, it implies that some 3 million lower class poor will escape from the poverty classification, and thus pass beyond many of the low productivity barriers of their class and culture. This is one-third of the lower class, poor children.

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*Thus, in the Orshansky data the poor had 15,000,000 children, while above we assume that 15,000,000 in lower class families would have 9,000,000 children, leaving 6,000,000 over for the non-lower class poor.

**Compared with an uncorrected average for non-poor children of 72% in the foregoing table.

This would indicate that there is likely to be a good deal of lower class mobility, that the "culture of poverty" is to a large extent a culture of class transients, much like the culture of skid row. However, we know from the experience of many investigators that there is also a self-perpetuating, lower class bio-cultural stratum. Let us hypothesize how big this group might be by using the AFDC data on second generation welfare recipients and the data on the vertical mobility of the poor. Many lower class rural families may not have needed or received welfare in previous generations because their culture and subsistence living were congruent. However, this same culture cannot provide enough basis for productivity when its bearers are transferred to city life. We might guess that 60%-70% of AFDC recipient family heads come from lower class families*--for whom we have guessed that about a third of the children will rise out of this class. It seems fair to assume that most of these latter will come from what we have called "incipient riser" homes, those in which at least one member preserves the values or styles of the class above. These homes will represent for at least one of the parents only a one generation lapse into the lower class milieu and pattern of life. This suggests that there is a transient lower class, which includes perhaps 30-40% of the nine million children in the lower classes. If the children of this group achieve high school or better education at a higher rate than the non-lower class poor (60%) instead of at that of the total lower class poor (40-45%), then this 30-40% of the lower class children will account for about 1.6 million of those who "escape" from the lower class in the next generation. That is, about 2.0 million of about 3.2 million "transients" will graduate from high school, and 1.6 million (80% of 2.0 million) of the 3 million will escape from the poverty culture and from poverty. Perhaps, then, another 1.4 million will also escape from the much larger "static" group through education.

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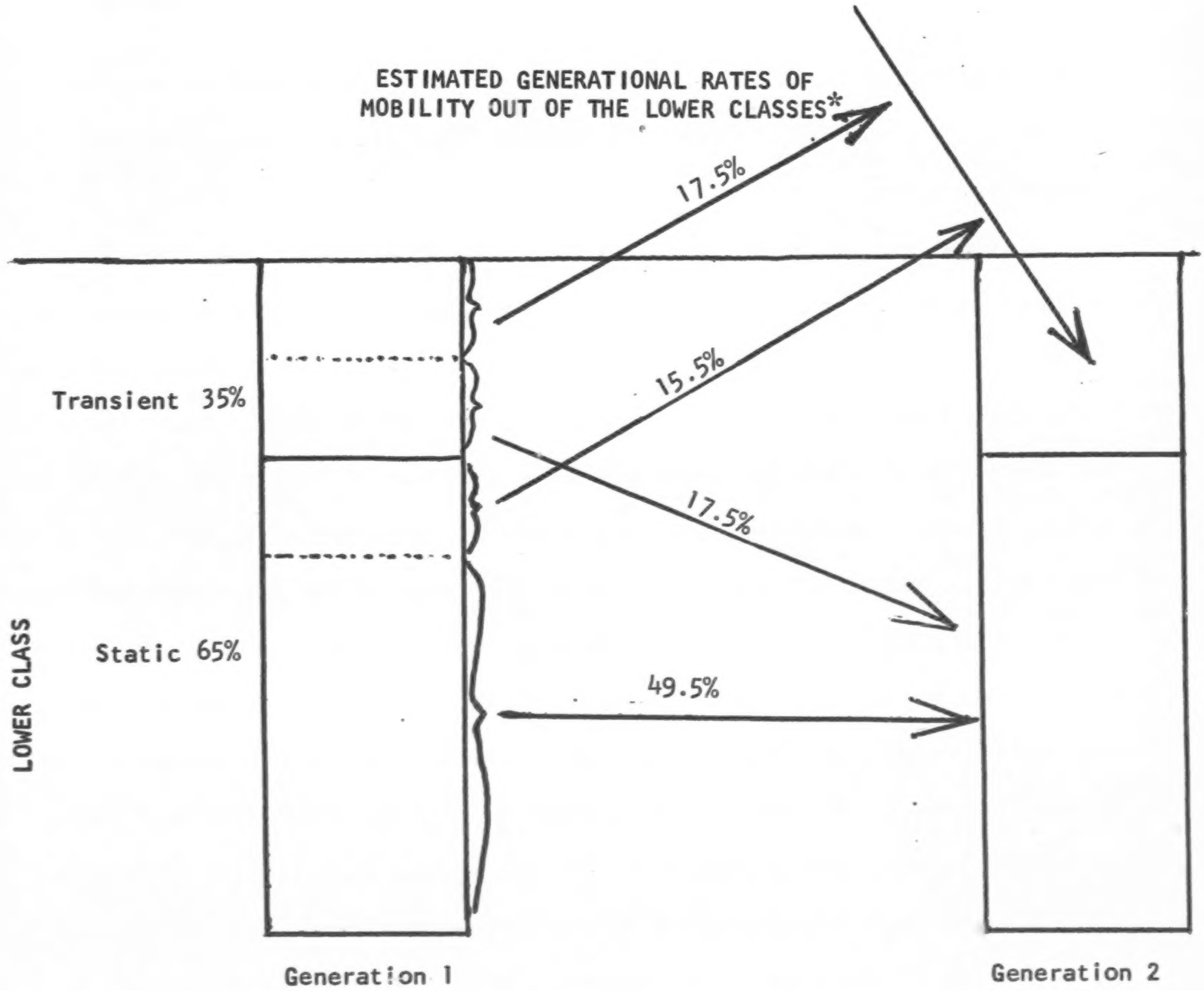
*M. Elaine Burgess and Daniel O. Price, An American Dependency Challenge, Chicago: American Public Welfare Association, 1963.

If these estimates are reasonable, about 33% of the children of the lower class tend to achieve a status in some higher class. Roughly this 33% is made up of 17.5% who rise from the one-generation transient group, and 15.5% who rise from the larger "static" (more than one generation) lower class.

Downward mobility is assumed to occur for about a half of the "transient" group, so that those entering the static lower class from transient status in the previous generation would account for about 10% of the lower class. That leaves about 50% of the poor who start in the "static" lower class group and remain there in the next generation. These presumed rates of flow are illustrated below:



ESTIMATED GENERATIONAL RATES OF MOBILITY OUT OF THE LOWER CLASSES*

17.5%
15.5%
Transient 35%
17.5%
LOWER CLASS
Static 65%
49.5%
Generation 1
Generation 2

This model assumes that upward mobility is much more common among the one-generation transients than among the static lower class. Presumably much of this difference arises because the transient families frequently contain a parent or sibling who aspires to the standards of the higher class. In the case of the static group, upward mobility seems more likely to arise as the result of factors such as exceptional intelligence, an outstanding adult model from another culture, or association with members of the other cultures in such contexts as school or the army. Access to such outside sources of inspiration for upward mobility is probably considerably less for members of the static lower class.

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*Calculations here are based on crude guesses from analogical material. They are meant to indicate something of the numerical nature of the problem, and to suggest some of the numbers that we should know with more precision. In particular, I do not wish to imply that if birth rates were equal for all classes and the same numbers were recruited into the transient lower class each generation, then the lower classes would be growing at 2% a generation.

Data from other sources indicate wide general agreement that the rate of upward mobility from the lower class is between 25 and 35% each generation, not only in the U.S. but in most of Western Europe and also in Japan, and that these rates have changed little if at all in the industrialized countries over the last 50 to 70 years for which there are some data.* Data which include farm workers for those countries show lower mobility, and presumably mobility is much lower in the traditional and agricultural societies of the underdeveloped world.

What are the limits of social mobility? Rates of flow such as these cannot be interpreted unless there is some model of "expected" or normal flow. Are the rates we have assumed for class mobility under present circumstances high or low? It may be of interest to consider briefly the flow rates that would occur in a society with perfect mobility and perfect equalization of opportunity.** Under these circumstances, let us define the lower class as those at the lower 20% of the income distribution. Let us start by assuming that native ability (which may emerge under genuinely equal opportunity) is distributed at random among all classes of society. Then at the start we should expect that 80% of our lower class in fact merit higher positions, while 20% of our not-lower class merit being in the lowest class. If there is perfect mobility, the 16% misclassified too low and 16% misclassified too high will be transposed. Putting it the other way, it is unreasonable to suppose that even under perfect conditions more than 80% of the bottom 20% should be upwardly mobile. (We are ignoring now the additional culture features of that class and concentrating on its economic productivity and ability, or assuming that the culture is related to the fact of having the lowest rank order in the economic society.)

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*See the reviews by Seymour M. Lipset and Natalie Rogoff, "Class and Opportunity in the U.S.: Some Myths and What the Statistics Show," Commentary, 1954, pp. 562-568; Seymour M. Lipset and Reinhard Bendix, Social Mobility in Industrial Society, Berkeley: University of California Press, 1959; Bernard Berelson and Gary A. Steiner, Human Behavior: An Inventory of Scientific Findings, New York: Harcourt, Brace and World, 1964, pp. 468-476.

**Such an exercise is carried out in the form of a science-fiction novel written from the viewpoint of the Year 2033 in Michael Young, op. cit. The 20% lower class group is taken from R.D. Gastil, "Toward a New Basis for the Evaluation of Anti-Poverty Programs," in HI-1006-RR, op. cit.

What the effect of a class ordering is upon the next generation depends upon (1) the rate of intermarriage across class lines, which is probably low and will remain low, and (2) the complexity of the genetic patterns that affect ability and hence the speed with which social selection by merit-advancement will result in stable inherited patterns of merit. This might be stated as the probability that a low-ability couple will have a low-ability child, or, more generally, the correlation between the abilities of parents and children under conditions of perfect mobility and opportunity. The genetic basis of such selection is not understood, but is almost certainly complex. It seems highly likely for that reason alone that even under perfect equality of opportunity substantial misclassification of the next generation would still result, requiring further mobility, and the effect would not rapidly produce a stable segregation of classes by ability. Moreover, "ability" is not a unitary trait since society recognizes and values a very diverse list of abilities and traits, any of which might be a basis for achievement. Michael Young envisions that the consequence of effective equality of opportunity would require rapid upward mobility at first, but would rapidly trail off as effective natural segregation ensued. However, his scenario depends upon the existence of a unitary and simply inherited trait of "intelligence," almost certainly contrary to the actual mechanisms of the inheritance of traits viewed as socially useful.

To what extent has such a form of natural selection actually been operating in the last few generations or centuries? In populations that have experienced some degree of merit mobility for a long time, even a small rate might have produced some significant partition of the gene pool. This would be much less likely in the case of groups whose status has been clearly prescribed on the basis of criteria other than merit. In that case, other things being equal, once opportunity was equalized, artificially segregated minorities (castes) should have better genetic potential for advancement than those in less formal low-status groups. Whether indeed there are differences in the genetic endowment of races or stocks that would have some bearing on the distribution of status under equal opportunity is unclear. In its pure form the social experiment of providing effective equal opportunity and watching for the outcome has never been tried, and very little good evidence of such an effect (or its absence) has ever been mustered.*

These speculations could be used as a basis of speculation as to the limits which an ideal social policy would be working against in trying to increase the mobility of a lowest 20%. For example, let us assume that there has been some genetic differentiation in the past so that 60% of the children of Negroes in the lowest 20% should move out of this class in any one generation and 30% of white children. If so, then our mobility estimates above suggest that there may be little improvement possible in the rates of white mobility, while Negro mobility could at least double. This might have important implications for educational policy--assuming, of course, that the assumption of an equal distribution of income potential characteristics characterizes white and black.

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*We are here speculating on the possible conseuqences of genuinely equal opportunity for the consequent demography of social classes or levels of productivity, and not on social policy regarding equal opportunity for minorities.

3

NOTE TO SECTION A

SHOULD CULTURES OF POVERTY BE PRESERVED?

The discussions of poverty measures in Part III may justly be accused of attempting to reduce the number of those who in the next generation will be found to exhibit certain characteristics associated with cultures of poverty. This means, in particular, that there will be a decline in the number of those who are taught by life to put a high value on impulse, who do not take seriously the responsibility of a man for his own life, his family, his community or nation, or who show little respect for laws or for persons of age and status. It may also mean a decline in the number of people who live in female-centered families, who share their wealth readily with their neighbors, and of those with little money who place a very low value on work and productivity. I do not necessarily wish to reduce the frequency of the latter group of characteristics, but I do wish to reduce that of the former. And in doing so I realize that in the American context the second group is apt to decline as well. Let me suggest why, and why I feel justified in trying to reduce such characteristics as male irresponsibility for the family.

A great deal of writing on cultural relativity has been careless, and the impression the lay reader has derived from this writing often erroneous.* In fact, the rules that cultures lay down for human behavior are very similar, particularly on roughly equal levels of societal complexity. The degree to which behavior conforms to these rules varies greatly. But when a people is vigorous and self-confident the rules are followed to a significant degree. When under stresses, such as that of the heavy impact of another and apparently more successful culture, rules may become hollow slogans, seldom adhered to in practice. The degree to which rules are adhered to behaviorally, and even strongly insisted upon verbally, also varies by "class" within any society. In general a group analogous to our middle class,* and usually representing the majority of any people, inculcates a fair degree of adherence to the basic rules of its society. Often there are people who have power enough to flout the rules of their society, at least in private, forming a kind of criminal or wastrel upper strata. More universally, those who do not follow the rules, or are not expected to, because of poverty, social or ethnic origin, or previous "misbehavior," form a lower class. This lower class may or may not preach the same rules as the middle class, but it certainly does not follow them so closely. In addition, there may be variant and deviant codes of behavior for small subgroups. These are firmly acceptable only if they are consecrated to a symbolic or material purpose of the community (e.g., monks or Janissaries).

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*For example, the classic work by Ruth Benedict (Patterns of Culture) appears in retrospect to have been a deliberate twisting of the sources available to her.

The "middle classes" of history, and even of primitive societies, have, then, a broad degree of similarity in their social codes. Within this broad band there are, of course, many significant variations. But such "middle class" cultures have everywhere emphasized adherence to the group's norms as a value in itself, and respect for those persons who symbolize group values. They have always emphasized respect of children for parents, and by extension, of the young for the aged (at least until they retire); man's duties and responsibilities to his family, his community, and to any larger order that the particular culture recognizes. The hero is one who sacrifices his whole life for these values--and heroism is universally praised. For a man the "family" may in this case be that in which he was born, the families of his sisters and brothers and their children, or that of his wife and her children, or all of these. Men always are given clear responsibilities for bringing up as successfully as possible some particular group of the young. The responsibility of women is equally stressed, but few question it.*

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*Generally subdivided into middle and working classes in modern sociology. A working class person values work and family, but does not value education and career as highly as the middle class. The following discussion emphasizes the features which are common to both.

Much of the apparent irresponsibility and freedom of impulse observed in other cultures is actually found on closer examination to be closely patterned, or limited to specific occasions or periods. Middle classes everywhere emphasize that following the rules regularly is necessary both for a happier life for the individual in the long run and for the smooth functioning of the group.

Although overemphasized, there are important differences among cultures in social and economic values. Emphasis may be placed quite differently on personal property values, on in-group sharing, and on individualism. Most peoples have tended to see the economic pie as fixed in size, and therefore it is feared that the exceptional person will use his abilities to diminish the shares of others; to be exceptional is dangerous and success may seem criminal. Individualistic societies have been rarer, but their growth more rapid, so that by 1900 they came to rule most of the world. In this framework individual economic initiative was more rewarded--and one reward was to allow the individual to deny his property to his neighbor. Since there was no longer felt to be a fixed economic pie, each individual could legitimately prove his worth by working harder to provide for his immediate family or for coming generations. Thus work, even beyond the requirements of a year's supply of minimum essentials, came to be highly valued, and finally became a value in itself in Western civilization. Again, similar values on work can be found in most cultures, at least in embryonic form, but there is probably a difference in degree.

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*Exceptions may be found in the literature, but these are generally ascribable to cultural breakdown--e.g. the Marquesan Islanders.

Most cultures have had roughly similar values for important and still valid reasons. Societies continually disrupted by the expression of human impulse found it harder to survive the pressure of enemies or of starvation. In more recent times, neighbors have noticed that more ordered life often resulted in a newer washing machine. In societies in which parents took little responsibility for the children, the children grew up relatively unproductive--if they grew up at all. Neighboring groups grew more rapidly in population and skills. Finally, the women of the former society preferred to marry into neighboring groups rather than their own, with its unproductive, if occasionally charming, men. Moreover, where parents took less responsibility for their children and for the reputation of their family, both they and their children became a disruptive influence in society, thereby destroying its cohesiveness and unity in the face of threats.

The development of lower class cultures of poverty have, of course, also been adaptive for the individuals concerned, if not for their societies.

Primarily, if an individual is not going to be given a roughly equal slice of the goods of a society, and if there is a way to survive in terms of one's own standards without following middle class rules, why should an individual submit to the middle class code? Often the member of the lower class would do a little better in the long run by following these codes, but he does not have much to lose by not following them. And his many fellows at his level have often built up over generations lower class codes of behavior, almost anti-codes, if you will, which must be followed to achieve the comfort of their esteem.

But since this latter is the culture of failure and the middle class the culture of success, lower class society becomes essentially parasitic upon the middle or upper class. Even if the lower class person receives a poor share materially, that share is more than he would get if the middle class society were torn away. Lower class people would have to recreate a middle class culture to survive for long in this world.

Most poverty programs have as their goal an increase in the advantages which a person from a poor background may see in following middle class codes and expectations. And fortunately or not, these codes will be within the narrower limits of the American version of middle class culture. I personally think that many different types of middle class societies are acceptable bases for social life. Thus, the lower class person could become "middle class" in this general sense by organizing his life around the support of his sister's children. But I doubt if this will become a dominant pattern in the American context. The gratifications of responsibility, e.g., respect and deference--will probably not be granted by the sister and probably in too many cases not by her husband. The lower class American must be swept up in responsibility for his wife's children--or not at all. (Her children would not have to be biologically his.) He could adhere to a universal middle class standard and produce only the minimum wants of his family, but American society is not going to let him. It is going to place the definition of his wants at a higher and higher level, and he is going to have to place a value on work and goods uncommon perhaps for a 15th-century "middle class" man in a Zuñi pueblo. If he is going to be asked to be more productive, to work for higher and higher material standards, then a man striving for middle class status is not going to be willing to share the results of his work with those about him. If his children can go to college if he works a little harder, he is going to be loathe to spread his hard-earned margin among his relatives. The cooperative community of impulse workers will be broken up.

We are, then, trying to make more acquisitive, industrious, less spontaneous, but more serious and responsible middle class individuals out of the lower classes. In the process, many people will lose characteristics that our intelligentsia may value in them. But I know of no other way within the limits of justice to eliminate poverty as currently defined, or to further equalize opportunity among rich and poor. Basically, I do not feel that there is a culture of poverty that the government has a responsibility to preserve as it attempts in other ways to lift the level of the poor.

B. MEANS OF INCREASING MOVEMENT OUT OF THE CULTURE OF POVERTY

1. Introduction

Equality in educational opportunity is much greater today than in income, and equality in final educational achievement is also considerably more than in money terms. By comparison, the distribution of incomes in the United States is not much different than in India, but the educational differences among classes are much more extreme in India.* I would suggest that for the next fifty years the lowest 20%, insofar as they are justly at the bottom, are not going to need much more education in a technical sense than they will receive on the basis of current extrapolations of trends. There will continue to be many service and laboring occupations for which the average employee may be, in fact, academically overeducated. The appropriate training here is usually on the job. Yet the value of education in terms of creating a better subjective life, in terms of taste, knowledge of political affairs and so on, may be considerable, and as such is a right of the poor and their children. Again, this is the group least likely to know what it wants, or even to desire what it should have for themselves and their children, so paternalism will continue to exist in this area. (In a society organized on principles of justice much stricter than our own, the lowest 20% would naturally be expected to exhibit personalities transitional between "childhood" and "adulthood," as usually conceived.)

One imagines that federal aid to state and local school districts should be a first priority item here. For since the poor districts do not offer so much, they do not compete successfully in the market for teachers. A general rise in teachers' wages (but not "qualifications") should allow a weeding process to occur among teachers which would do more than any other program to improve education in poorer areas.

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*Cf. Laurie Rockett, "World Poverty to the Year 2000," op. cit., and studies on the spread of education in India versus the U.S.

Education in a much broader sense is also a way to approach the problems of low productivity associated with undesirable attitudes and behavior. One of the most important types of education is through increasing exposure to the middle class world. Theoretically, this could be achieved through economic class integration, through scattering the poor. In many cases, however, a people can maintain their level of society in spite of spatial dispersion. The Diegueño Indians of San Diego County, California, have been scattered for a hundred years on tiny reservations in the county, some with as few as one family. Many attend integrated schools. They have lost nearly all of their native culture, yet the majority have a common variant of the culture of poverty of lower class pattern as we have described it. A certain number of people of this group, or of any lower class group, do, however, take on the model of the alien middle class culture, perhaps a middle class teacher or fellow student, and carve out a new and more productive life.

One of the best ways to achieve the goals of "character-training," if we may call it by that name, may be to have a person take and keep a steady job. This may be attained, as perhaps in World War II, by increasing the monetary opportunities and incentives of the poor to the point where either the differential between relief and wages is dramatically large* or merely by availability of reasonable jobs. But at the expected welfare standards and wage levels, it is hard to see how present differentials can be increased. It will be difficult even to maintain them, if some current proposals for straight income maintenance are enacted.

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*A documented example of rapid change under these conditions is given by Norman Chance, "Culture Change and Integration: An Eskimo Example," American Anthropologist, December 1960, pp. 1028-1041. Experience with Eskimos elsewhere in the Arctic indicated their situation resembles that of the American Indians, given standard poverty conditions.

In some societies the goal of steady work is attained by the pressure of want. In our society we must turn to the use of law to compel improved behavior, since we no longer countenance a really draconian use of want for an individual--certainly not for a family. Let us take as a behavior pattern to be changed, the frequently cited disinterest of the father in support of the child and suggest the possible influence upon this trait of increased application of non-support laws.* Some fathers would perhaps be more willing to support their children if making a living were easier. But our objective here is to make the poor father more interested in supporting the child, and therefore to provide the father with more incentive to work productively. Exhortation and direct advice have often failed. Legal penalties might be more effective. If more non-support actions could be carried through to conclusion, then the wrongfulness of non-support might begin to make a greater impression on more people.** We notice in the education of children that an action which at one period of development could only be imposed upon children by force is in later years seen as right and proper in a moral sense. Similarly, children growing up in a household in which the father is forced to work, or forced to support the wife, may have little respect for the father, but considerable for the law and its rightfulness. At any rate a boy in his early teens may have a less casual attitude toward becoming a father. Just what changes in present laws and procedures might be necessary is not clear. In many cases, additional time and effort spent on enforcing present welfare regulations and non-suppor laws may be sufficient. This might mean a national system for tracing down absent fathers.

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*Family stability and the presence of the father are not obvious goods in themselves. In many families, the presence of the father is probably not desirable. Indeed, recent studies have shown that for all families, and particularly Negro families, the lack of a father's presence contributes little to the low educational performance or the delinquency of children that is not accounted for by other factors such as neighborhood, income or education of parents. (B. M. Fleischer, "The Effect of Income on Delinquency," _op. cit._, p. 132; James S. Coleman, _Equality of Educational Opportunity_, U.S. Department of Health, Education and Welfare, 1966, pp. 301-302.) However, if we are interested in the productivity of the father, and the chance of the father raising the family out of poverty, then we should be interested in the father's interest in and support of the children. That is, I judge that the father's sense of responsibility for his children will help his productivity, even if it does not help his children directly. But if as a result the family has more money, then he will help the chances of his children. For the same studies show that the wealthier the family, the greater the chances of the children.

**I do not think this would be "cost-effective" in the short run reduction of welfare budgets. It might be very expensive. There is, however, a tremendous demand for this kind of help among the poor, as witnessed by recent experience with free legal services. (_The New York Times_, September 2, 1966, on legal aid to the poor in Wisconsin.)

Another example is the ease with which some people apparently get around the regulations of unemployment compensation arrangements and general relief, by making less effort to find and hold jobs than the law intends. Caudill has pointed out how a demoralizing climate of illegality and subterfuge in favor of the poor has built up around the administration of a complex web of welfare programs in the Cumberlands.* Much the same climate may begin to exist in the world of welfare of the large city. Again by increasing the rigidity of enforcement, the wrongfulness of the behavior of the lawbreaker would be strengthened in the mind of the poor individual and the community of the poor.

At the same time as the law is made stronger, it may be made fairer. This means both that discrimination against the poor and the special groups of the poor must be reduced, and that the generality of law enforcement must be maintained in all communities. Often poor areas are so shot through with crime and illegality that any enforcement of a minor law seems an arbitrary intervention in the natural scheme of things. The great middle class, whether of Nova Scotia, New York, or Alabama, assumes that the law will be broken by the poor, and that as long as the acts of the poor are against one another, this is really not very important. In some areas this may lead to the institutionalization of light sentences for the crimes of the poor.* But the result is that the general respect for law and the middle class standards these represent is lowered. Thus, if we are really interested in changing the behavior of the poor, an increase rather than decrease in arrests among the poor may be a desirable addition to a well-rounded educative program.

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*Cf. Harry Caudill, op. cit., pp. 273 ff.

Thus, as we look at education in the following sections we will be looking at everything from changing the context of formal education to vocational training, to new environments for the poor. The most successful education for cultural transfer will probably end up affecting all of these areas of concern.

2. The Possible Cost of Financing Mass Movement Out of the Poverty Subculture Through Training

To the administrator the question "How stable is the culture of poverty?" may mean how rapidly the constellation of traits that now appear to make up the "culture of poverty" would be altered under other circumstances. The minority who have "made good" from a poverty culture appear to have been able to abandon the culture very rapidly. But this is not a good indicator of the likely response of those who would not have made it on their own; the self-made group is also a self-selected sample. It is difficult to find instances in which persons clearly in poverty cultures have undergone advancement from forces quite outside themselves, or have experienced random economic transformations or wealth unrelated to their own efforts. Some collective examples are provided by instances of fortuitous development of backward areas (e.g. the discovery of mineral resources in a depressed area, the creation of military bases in remote spots, etc.). It is our impression that the view is well founded that "poverty culture" dissipates rapidly under the impact of sustained prosperity and stable new cultural roles (especially as employees). But there are important counter-cases when the wealth was erratic or unstable (lottery winnings, windfall claims, settlements of land rights to Indian tribes). What means exist by which--cultural change--and in the desired direction--could be accelerated for those who share the "culture of poverty"?

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*Cf. John Dollard, Caste and Class in a Southern Town, Doubleday, 1937 (1949), p. 279.

The lower class (who are also the majority of the poor) are indeed characterized to an important extent by habits, values, and attitudes that diminish their own economic potential, contribute to some extent to their difficulties, and are also the object of disapproval or the basis of discriminatory rejection by the majority society. To say this is not to deny that there are also strengths and values among some of these traits of the lower-class poor. Note too that the same traits may appear as either assets or liabilities, depending upon context.* At the same time, neither of these views amounts to a belief in a distinct culture in the anthropological sense. The poor share a great many of the goals of the middle class, but often feel hopeless or frustrated in achieving middle class goals. Much of their behavioral pattern consists of the consequences of, or adaptations to, that feeling of exclusion and relative deprivation. Thus the problem of the "culture of poverty" is not simply the conventional problem of cultural change or culture conflict. In the long run, individuals who move out of the economic circumstances and the social milieu of the poor will have little difficulty in being assimilated into a middle class culture which is already largely familiar to them. What remains as the interesting problems of the behavioral traits of the poor are the following:

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*The much discussed matriarchal pattern of the Negro poor may be seen either as a serious weakness, hampering the development of male initiative, or as a competent and adequate response among Negro women to a problem (desertion by the husband) which also faces white women and with which white women appear to cope less effectively when faced with the same problem.

1. The persistence of behavior patterns that make it harder for the lower class to be effectively employed in a middle class culture, or to be effective entrepreneurs, prevents the change in milieu that would (if brought about) do much to assimilate (former) lower class individuals to middle class society.

(a) Can these behavior patterns be changed, so that a sequence of linked changes of economic productivity and social status can then move forward?

(b) Can changes of milieu, employability, or income be brought about without the necessity of an "admission ticket" of prior behavioral change?

2. In any society in which income is related to effective economic output, there will inevitably be a bottom twenty per cent. The fact of being in this bottom group is the source of an important part of the social pathology of the poor, and hence is likely to persist because of the likely persistence and comparative stability of differences in earning power. If this effect is taken seriously, there is an important sense in which the poor are "always with us": moreover, the effect may be quite as serious in equalitarian or equal opportunity societies as in more rigidly stratified ones.

There are currently many proposals and programs in being for speeding up the transition of persons out of the lower classes. The settlement house movement, special classes in education in English, citizenship and hygiene helped to speed movement from lower class levels for many immigrant groups. Today, headstart programs, camps, job training and military training all assist the schools and churches in the process. For children from static lower class families, it appears that few experience enough of a boost really to take them from one culture to another. But even if four out of five are not helped, the record of achievement might still make these programs worthwhile, provided the yield warrants the cost.

Among the variety of approaches to training, retraining, and education that have been suggested, modification of the "culture of poverty" is either a direct goal or else an expected by-product of preparing the individual or his family for a new social role and a new social context. Often these involve _job training_ and _relocation_. In this regard, it may be useful to examine the rather long but not altogether encouraging history of the efforts of the Bureau of Indian Affairs.

Culture-change and the Indian Bureau. In the nineteenth and early twentieth centuries most Indians slipped from identification with their own cultural patterns to patterns rather similar to the lower class model. The cultures of many Indian groups were, in fact, not too different from those we have outlined for the white lower class cultures (especially if we distinguish behavioral norms from ideals). The basis of the reform of Indian policy was a sort of "war on Indian poverty," a proposal that was spelled out in the detailed Merian report of 1928.* This study's primary proposal was to get away from the pauperization of the Indians with its emphasis on "per diems," and to emphasize a broad upgrading of educational programs of all sorts, particularly through the improvement of personnel.* These recommendations were apparently implemented,** and to a far greater extent than is generally recognized today. Yet the problem of the Indian's transition from a pauper state--and thus to a large extent from lower class culture--was by no means solved by this emphasis, nor by the Indian development projects which helped only a few.

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*Louis Meriam, (Tech. Dir.) _The Problem of Indian Administration_, Institute for Government Research, John Hopkins, 1928.

The Bureau of Indian Affairs attempted to meet the challenge of Indian poverty by moving from a policy of welfare assistance to one of active assistanc with emphasis on education. This program offered the Indian three avenues of advancement:

(1) New cooperative or communal economic organization, able to provide a good living for those willing and able to cooperate,*** established on some reservations.

(2) Assistance to individuals to become independent agriculturists on their own land.

(3) Assistance to Indians who moved off of their reservations to take urban jobs.

This last was to be accomplished by residential vocational schools and by providing adults with general and specific education and counseling, and then helping them to get off-reservation jobs.

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*Ibid., pp. 3-51.

**Cf. Hawthorn, Belshaw and Jamieson, op. cit., p. 486.

***Newton Edwards and Harold Getty, in Fred Voget (ed.) "American Indians and their Economic Development," Human Organization, Winter 1961-1962, discuss earlier Indian training programs. AVT is described in Training Facts, U.S. Department of Labor, December, 1964.

A renewed program of training for urban occupations was launched in 1961, under the Adult Vocational Training program of BIA. It pays not only for up to two years of training, but also provides the costs of transportation and maintenance for the trainee--and his sometimes numerous dependents. Support is also available if the trainee and his family must relocate again in order to take the new job for which his training presumably has qualified him.*

In general, the attempt to provide employment on the reservation and thus raise vistas by direct employment assistance and training has been successful in an important number of instances, but has not reached the point of generally transforming either the culture or the employment status of most Indians.

The governments' job training and placement program for adults has apparently been the most successful of its Indian project. Between 1952 and 1963, nearly 30,000 workers received employment assistance. Only 60% of these became permanently employed; and "permanence" was established for that 60% on the average only with the third job they attempted.** One suspects that the people who find their way into the program have been the more aggressive reservation Indians rather than average, but still the gains seem considerable.

We might take as a model for a program to change culture the BIA's adult job training program with relocation, counseling and follow-up. This appears to have been more successful per dollar than any other program, including general education, in improving the general economic position (and thus class culture) of Indians over the last thirty years. The present AVT program is said to cost $4200 for a family head and $1900 for an individual.*

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*Cf. Louis Meriam, op. cit., pp. 712 ff., and Hawthorn, Belshaw and Jamieson, op. cit. See also the Ute and Sioux cases in F. Voget (ed.) op. cit.

**Material on employment from a statement by BIA, USDI, submitted to the Subcommittee on Employment and Manpower of the Committee on Labor and Public Welfare, U.S. Senate, September 10, 1963.

The approach concentrates on short- to medium-duration courses for adults, with job placement, relocation if necessary, family support if necessary, job placement above poverty levels and job follow-up until permanency is achieved. This latter is perhaps the most essential feature. In a few cases counseling, relocation and placement may be sufficient. The concentration is on young adults, although some teenagers and middle aged men are included.

Applying the BIA approach to all the Poor. If a similar program were to be applied to all the poor, unrelated individuals as well as family heads, this might be the cheapest way which is available to increase mobility out of the lower class. How big a program would be possible and desired? Of the 7.2 million heads of poor families, perhaps 3 million could be trained in a program of this type, while only 1.5 million unrelated persons could. In addition, one might choose to include perhaps 1.5 million young persons in poor families who are not family heads. Using these estimates we might then estimate that this target group would include 6 million poor persons capable of training and/or placement. The successful training of these persons would affect the mobility chances of at least ten million of the fifteen million poor children. If 60% of the six million attain permanent positions at more than poverty levels and 50% of the lower class heads of families involved in the program thus lift their children out of the lower class group, then the mobility of the lower class will be considerably improved. If we assume that 6,000,000 of the children in the poverty group which will be aided by this program were from lower class families, then we can calculate the improved chances for mobility.

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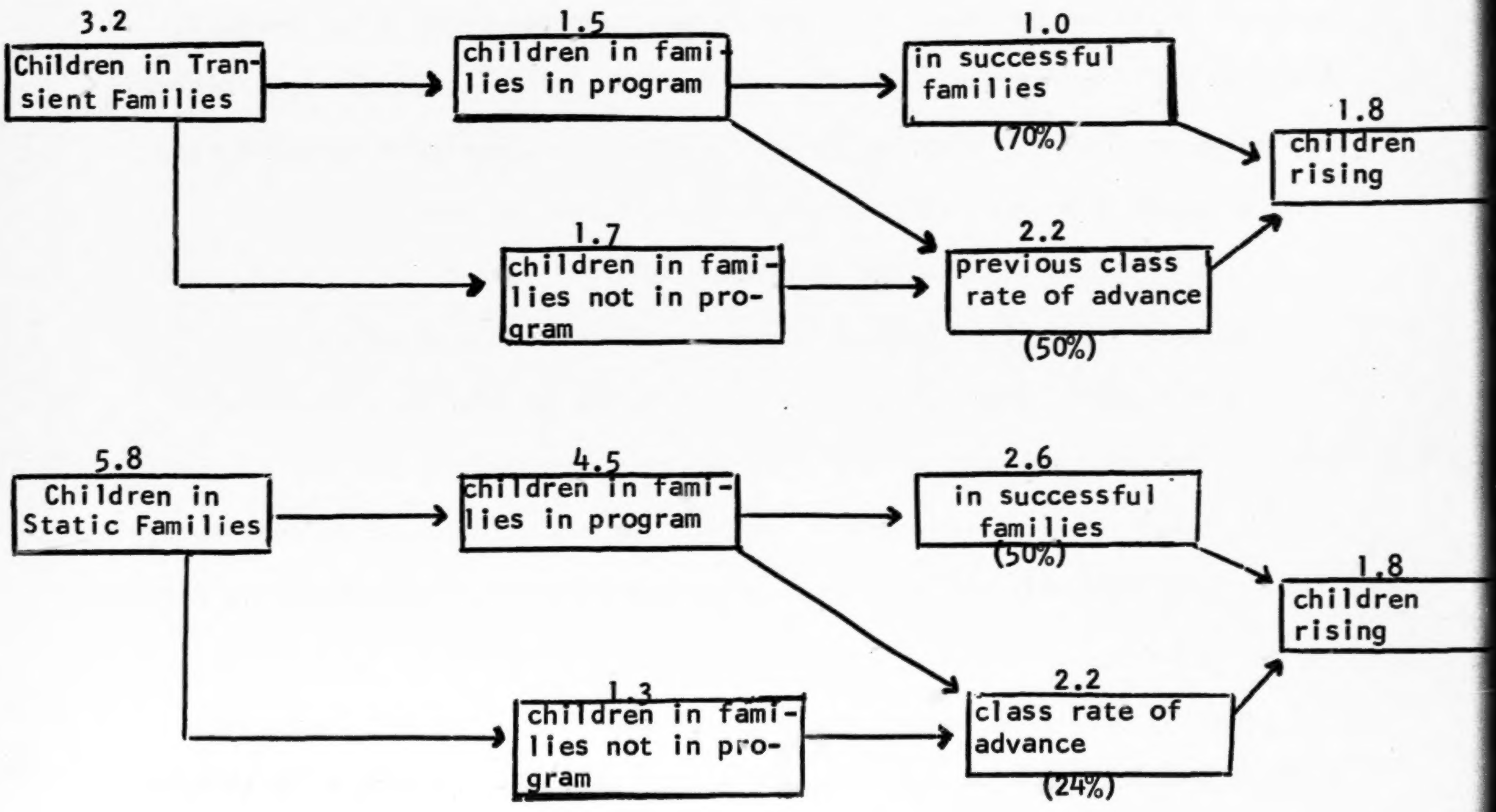
*From "Vocational Training Programs for American Indians," Training Facts, December 1964, Office of Planning and Standards for Manpower Development, U.S. Department of Labor. This discussion is also based on a number of releases of the Bureau of Indian Affairs.

To make a calculation of this kind let us go back to the estimated rates of mobility out of the lower class (above, Section A, Table, p. 3-23) and estimate what the effect of the suggested program might be. Let us assume that there are 9 million children, 3.2 million transient lower class and 5.8 million static lower class. We must assume that the transients are brought into the program at a lower rate because they are formed by the absence or disability of the normal breadwinner. Female heads of families in the transient group are also less likely to see a separate occupation as a goal than those in which mother's role as chief provider is more accepted--i.e., the static group. The suggested programs would also have as an objective special attention to the static group. However, once in the program, we should expect that transient families would be slightly more successful than the static, and than the BIA sample (66% versus 60%). Because static families are so thoroughly involved here, their percentage of success might be slightly below 60%. Successful families should greatly improve the chances of their children. However, since the transient group already shows 50% mobility out, and 80% is a suggested theoretical maximum (both by the 20% poverty class model above and by the 20% fathers of poor in poverty data from Morgan) for mobility out of the lower class, 70% seems a generous estimate of what could be accomplished. For the static group, one assumes that successful completion of the program might double the chances of success of the children, or place them in the same range as the transients were without the programs. Thus, we get the following sketch of probable results:

Effect of Program on Class Rise of Children*


3.2
Children in Transient Families
1.5
children in families in program
1.0
in successful families
(70%)
1.8
children rising
1.7
children in families not in program
2.2
previous class rate of advance
(50%)
5.8
Children in Static Families
4.5
children in families in program
2.6
in successful families
(50%)
1.8
children rising
1.3
children in families not in program
2.2
class rate of advance
(24%)

Summary: Per Cent of Lower Class Children Leaving Poverty**

	Without Program		With Program	
	%	of whole of group	%	of whole of group
(35%) Transient	17.5	50%	20%	56%
(65%) Static	15.5	24%	20%	31%
Total	33%		40%	

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*Assuming about 60% of families in program are successful in BIA terms. Figures above boxes refer to children in millions. Percentages in parentheses below refer to per cent estimated to escape poverty in that group because of family performance.

**These figures are meant primarily as a way to sketch the problem quantitatively. They should certainly not be taken seriously in detail. See also notes pp. 3-23 and 3-47.

In other words, the suggested program might increase from 3,000,000 to 3,600,000 the number of poor children in present lower class families who would be expected to leave the class in which we now place their parents. Although our figures are obviously based on very loose guesses, this exercise may bring an improved feeling for what could be accomplished by a BIA type program given some optimistic assumptions. These include:

1) sufficient jobs can be made available
2) staff of sufficient quantity and quality can be provided
3) the static lower classes have a majority of trainable people with the motivation to accept training in these numbers
4) other non-lower class and non-poor will not simply be forced down into the lower classes by giving special attention to people in the affected groups.

What we are speaking of here is, of course, not feasible immediately without a growth of teaching and counseling capability to handle these numbers. It may not be feasible at all if lower class people would not cooperate on this scale. Perhaps it offers a reference point in relation to which other programs can be developed. It must also be assumed that the economy will be able to provide jobs for the trainees. This is perhaps an overly optimistic assumption. But it may be remarked that much of Northern Europe has experienced a chronic labor shortage for years. Their labor immigration in recent years should be comparable to the internal migration being fostered by the projected program.

If, in the absence of this program, the lower class would not expand or decrease, then the new program would mean a gradual disappearance of the lower class at the rate of 7% per generation (40% - 33% = 7%).* It seems important to realize how slow this class would disappear under such a program, even with optimistic assumptions.

We have been considering here only the gains from the education of heads of families, that is, from three million of the six million trained. The additional training of unrelated individuals and 17 to 20-year-old unmarried persons in the years of family formation would help avoid losing ground while the families with children in our target group are being "treated." The productivity of the target group might be upgraded over a six-year period with the final results accruing nine years after initiation. Six years would be required to get the original target group into the program while at least three years more would be necessary to finish training and achieve permanent job placement for as high as 60% of the trainees.

How much would it cost to train and place at this rate? Let us assume the estimates to be as follows:

	Trained Per Year	Cost Per Unit	Total Per Year
Heads of Family (3,000,000)	500,000	$4,500	$2,25 Billion
Individuals (3,000,000)	500,000	2,000	1,00 Billion
			$3,25 Billion

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*See note, p. 3-23. In addition, both the standard and enhanced mobility estimates are based on equal class birth rates, an assumption which is presently wrong. But there are so many other gaps here that I do not believe this refinement is necessary--and may soon be removed by changes in class-specific birth rates. (See R.D. Gastil and Paul C. Berry, Alternative Birth Rate Projections to 1975 for Maternal and Child Health Planning, HI-607-RR, January 24, 1966.)

This training, counseling-relocation and follow-up program of the type outlined would thus be applicable to about half of the poor (either as direct beneficiaries or as members of their immediate families), at an average estimated cost of $3250. But the number effectively trained and placed might be 60%, so that the costs per trainee helped should be $\frac{\$3250}{.60}$, or $5400.

After this programmed period is completed one might expect that for 20 years there would remain a pool of as many as 10,000,000 poor children which could not be reached by giving training to family heads. About 550,000 out of this pool would reach age 18 every year. The training and placement program would then concentrate on this latter group, costing slightly over $1 billion per year.*

These are very high costs. Nevertheless, the Bureau of Indian Affairs has been authorized to spend at comparable rates for the people they are helping. Thus they were authorized in 1965 to spend on this program $15 million for perhaps .2 million reservation Indians in poverty. For a population of 35 million poor, this would be $2,625 billion a year. The BIA is perhaps barely keeping ahead of population increase on the reservations with its program.

3. A Training and Relocation Program to Activate the Poor**

The poor suffer from personal deficiences and social barriers that together make significant advancement seem impossible. Generally stifled from infancy by the environment of poverty and unable to offer useful skills to prospective employers, the impoverished are often convinced that no possibility of change exists. This program would attack the fatalism of the poor in three ways: first, they would be relocated to remove them from the environment of poverty; second, they would be given on-the-job training in skills needed by employers; and third, they would be assured of self-respect and high long-term gains in return for earnest effort. This combined approach should be far more effective than if each one of these remedies were applied separately.

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*Training is figured here for all poor to reduce conscripts into the lower classes among the poor.

**Contributed by John Karlik, this section suggests one form in which The Bureau of Indian Affairs AVT program might be modified for an even more general impact on cultural change.

To briefly outline the program, before explaining it in detail, families would be recruited who are currently living below the poverty line. All of these recruits would be volunteers attracted by the prospect of high long-term gains in return for a determined, and sometimes unpleasant, effort to achieve self-transformation. Initially they would be placed in supervised camps and taught remedial skills and regular work habits. In these camps each family would have a separate, adequately furnished cottage. The training received here would be analogous to the instruction military recruits receive in boot camps. Families would be expected to demonstrate individual responsibility, and discipline would ultimately be enforced through the threat of expulsion from the program.

Following six to nine months of initial training, individual families would then be relocated in working-class neighborhoods, and the husband or chief wage-earner would begin to receive on-the-job training from a prospective employer. This training in a particular skill would be subsidized by the federal government, but to insure that the skill taught was in demand, the businessman providing the instruction would not be fully compensated for his costs. Housing for families would also be subsidized so that they could enjoy living conditions equivalent to the norm in the neighborhoods in which they are settled. During the period when the chief wage-earner was receiving on-the-job training, his (or her) family would occupy rented housing and make its initial adjustment to living in a working-class environment.

After up to two years of on-the-job instruction and life above the poverty line, wage-earners would presumably be fully qualified, and families would hopefully be well on their way to middle-class status. When subsidized job training was completed, families would be given the opportunity to relocate once again in another working-class neighborhood and take low-interest-rate mortgages on their own homes. The purpose of this final move would be to remove families from the neighborhoods where they had become known as formerly poor persons benefiting from federally subsidized housing and job training. By contrast, in their new neighborhoods, they would be prospective home-owners who support themselves and hold regular jobs. The government would initially hold the low-interest-rate mortgages on their homes, but after a five-year period, interest rates would be raised to the prevailing market level, and the government would be free to sell the mortgages on the open market.

Perhaps the most important objective of this program would be to demonstrate to the poor that their lives can be transformed and to show other Americans that investing substantial amounts in the poor may, under the right type of program, be a satisfactory way of dealing with poverty. If the experiment succeeded, it would demonstrate that at least some of the poor can be taught to be impoverished no longer.

Given this brief introduction, the specific characteristics of this program can be described in greater detail.

a. Recruitment, Motivation and Discipline

No program to aid the poor has attempted to lift them directly out of their present environment and alter their lives. On an individual basis, any such effort requires a high degree of motivation and self-discipline. This program, by contrast, would offer the poor an opportunity to place themselves voluntarily within an environment that would impose discipline upon them and that would encourage the growth of internally generated motivation. Of course, such an approach would not appeal to all poor persons or constitute a general solution to the problem of poverty. It would be most likely to appeal to individuals who desired to raise their economic status but either lacked the self-discipline necessary to do so or were frustrated by obstacles circumstance had placed in their path.

The chief incentive under this program would be the prospect of substantially higher earnings, comfortable subsidized housing, and financial independence. For some persons, however, the psychological gains from altering their self-image might be even more important. This combination of economic and psychic rewards should induce at least some poor individuals to volunteer for an intensive training program furnishing them with basic skills and carrying them a few steps towards a middle-class standard of living.

Because this program would depend heavily on stimulating and encouraging personal initiative, all those admitted should be volunteers. However, a large-scale effort should be made to publicize the program in ghettos and slums, and all families living below the poverty line should be invited to apply. The number of applicants might then equal several times the number of available places. The initial group should be carefully selected on the basis of previous signs of initiative and responsibility. By designing the selection process to insure a high level of initial success, favorable publicity for the program would be virtually guaranteed. This publicity, in turn, would help the program acquire a momentum and high-level morale of its own, would generate additional interest among the poor, and would give the poor confidence in their own capabilities.

Discipline should ultimately be enforced through expulsion from the program and, hence, the threat of returning to life in poverty. The fact that the persons selected would have been chosen from a much larger group of applicants can be used not only as a basis for individual pride but also as a prod, since several applicants would be standing ready to take the place of any person who dropped out. Minor infractions would be disciplined by giving the offending recruit the choice of either performing additional tasks to compensate for his misconduct or suffering a reduction in his family's food or clothing allowance. Social pressure and public self-criticism could also be employed to build group pride and punish those who failed to meet expected standards. Of course, before the applications of potential recruits are accepted, the strictness of the discipline in the training camps would be carefully explained to them.

Their willingness to submit to this discipline must be expressed voluntarily. Even after acceptance into the program, this willingness should be confirmed before recruits are permitted to enter the training camps.

Because the necessary ability to inspire both individual and group pride among the poor and the willingness to impose rigorous discipline probably cannot be found among civil servants, training camps should be supervised, staffed and, in part, financed privately. Moreover, it would probably be politically impossible for the government to impose this type of discipline on poor individuals. Although supervision and instruction would necessarily be secular and politically non-aligned, priests, rabbis, ministers and political activists could, and probably should, be included among the training camp staffs. Such individuals could help the program acquire its own internal enthusiasm and help recruits develop pride in themselves both as individuals and as participants in such a program. While the training camps would be privately run, state employment agencies, under federal government coordination, could aid in selecting recruits and finding job-training openings for families who have successfully completed their initial training.

b. Training Camps

As stated above, in the training camps each family would be provided with an individual cottage. These cottages would be supplied with the furniture and appliances necessary to raise the standard of living of families significantly above that which they had previously experienced. However, their living conditions would still be well below the standard they would event ally enjoy after successful completion of initial training. Thus, families accepted into the program would be both unwilling to return to their former neighborhoods and at the same time eager to reach the next rung in their upward climb.

The chief wage-earner in each family (in most cases husbands but sometimes divorced, separated, or abandoned mothers) would be given instruction in reading, arithmetic, basic English and--as needed--in typing, bookkeeping, or basic shop practices. No attempt would be made to teach a particular skill; instruction would be provided only in the fundamentals necessary to develop skills. However, on the basis of personal preferences and aptitude tests administered in the camps, each worker would be directed towards a particular occupation. In addition to instruction in reading, arithmetic, and basic English, women would also receive training in household management, family budgeting and marketing, sewing, and child care. As part of their training, families would be given a food allowance with which to purchase their needs in markets either on the camps or in nearby towns. A clothing allowance would also be distributed and used in a similar manner. Both allowances would be paid to the chief wage-earner in each family, who would then supervise their expenditure or give them to his wife for her management.

The camps should be kept small enough so that children could be sent to local schools, which in turn would be reimbursed by the federal government for the increase in enrollment. If necessary, the children from a single camp could be distributed among several local schools in the surrounding area. But the effort must be made to introduce the children to middle-class values at the earliest opportunity.*

The requirements that families would be expected to meet should be simple, explicit, and perfectly understandable to the families themselves. Moreover, these requirements should be of the type that failure to meet them clearly indicates lack of responsibility and initiative. Discipline within families should always be administered by the chief wage-earner, who in turn would be disciplined for infractions committed by members of his family. Thus, camp authorities would re-enforce his (or her) position as head of the family. While the main burden of meeting these standards would fall on the chief wage-earner, the performance of wives and children should also be weighed in any decision whether or not to expel a family from the program.

Development of regular work habits should be emphasized. The chief wage-earner in each family should be expected to be prompt for all classes, should be attentive in classes, and should be neatly dressed at all times. He *should not* be disciplined for failure to learn as fast as expected unless this failure results from an inadequate effort to apply himself. If a family fails and must b washed out, how it failed must be clear to the family itself and to all other fam lies who learn of its failure. Wives would be expected to observe the same rules; in addition, they would be expected to provide their families with adequate meals from their food allowance and to keep the family cottages neat and clean. Finally, a time limit, probably of one year, should be placed on a family's residence in a training camp. However, most families would be expected to successfully terminate their basic training in six to nine months.

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*For evidence that placing the children of the poor in middle-class dominated schools is the most effective way of raising the educational achievement of these children, see James S. Coleman, Equality of Educational Opportunity, U.S. Department of Health, Education and Welfare (1966), pp. 290-334, 491-523. The program suggested herein uses a similar approach, but instead of assisting just the children, the entire family is moved up as a unit.

While wage-earners and their families would generally not be penalized for slow learning, they would be expected to undergo an intensive program that spurr them to acquire basic facilities at the maximum possible rate. Eight hours of daily instruction would be supplemented by outside assignments. In addition to developing self-discipline, individual responsibility, and regular work habits, the families in each camp would be encouraged to cooperate in making their lives more enjoyable. Cooperative activities might include organization of social activities, construction of playing fields or small parks, and promotion of sports. To help families understand the personal and social reasons for their former impoverished status, discussions could be organized among parents as a form of group therapy. With proper leadership these discussions might eliminate much of the sense of personal failure and helplessness prevalent among poor individuals and substantially advance their adjustment to working-class life.

Once a wage-earner had developed the regular work habits and basic facilities necessary to profit from on-the-job training, he and his family would be relocated in a working-class neighborhood. If he could not develop these facilities after a year in a training camp, he and his family would be required to leave the camp to seek housing and employment on their own.

c. On-The-Job Training

On-the-job training would be provided by prospective employers, who would be reimbursed for most, but not all, of the cost of this training. The trainee would be paid a wage commensurate with his skill, and his wage would therefore increase as he progressed in his training. Wage payments to the trainee would constitute a major portion, if not most, of the cost to the employer. Subsidy payments would stop after one to two years, when the training had been successfully completed.

Subsidizing only part of the cost of training would ensure that the skills taught are actually in demand and would give employers a financial interest in the success of trainees. Moreover, a partial subsidy would save the government a portion of the full cost of furnishing similar instruction.
It should be pointed out to prospective employers that the subsidy payments could free corporate funds for upgrading the skills of existing employees. Thus, as opportunities were created for the poor, the general level of skills possessed by all employees could be raised to keep pace with the advance of technology.

If a wage-earner is unable to successfully complete on-the-job training or is otherwise unacceptable to his prospective employer, he would be dropped from the program and forced to seek another job without the benefit of a subsidized training period. However, he might be given some assistance in finding employment.

d. Relocation and Housing

The basic reason for relocating poor families, as has already been explained, is to lift them out of the environment of poverty and transform them into middle-class citizens. Thus, relocation should be into neighborhoods that are solidly working-class. The selection of a secure rather than a marginal working-class environment is based on at least two important considerations. First, a clear contrast would be provided for the poor themselves; this contrast would encourage them to transform their habits and attitudes rather than merely adjust them. Second, there would be no danger that the introduction of a single family could substantially alter the character of the neighborhood. To underline the point that addition of one family poses no threat to the neighborhood, the family should be provided with housing on a par with the general standard in the neighborhood. The increased quality of their housing would then become an aid to both parents and children in successfully attaining working-class or lower middle-class status.

As explained in the introduction, families would live in rented housing during the period when the chief wage-earner was receiving on-the-job training. Their rent payments would be subsidized to the extent necessary for them to live in working-class neighborhoods. Here families would make their first adjustment to the new environment. In most cases several months would probably pass before they would begin to understand and accept working-class values, and during these initial months some friction can be expected between these families and their neighbors. Each family member would make a number of false steps, and their efforts to change their way of life would probably be regarded with skepticism, if not hostility, by the surrounding neighbors. As trainees being lifted upwards with the aid of government subsidies, they would hardly command the respect of working-class individuals, who might ask, "Why can't they do it on their own, like we did?" Although upper middle-class persons might be more sympathetic than working-class neighbors towards the problems of the poor and the reasons for their unfortunate position, it would probably be unrealistic to hope that in a relatively brief period, the poor could raise themselves above the working-class level. Moreover, to the extent that the government and society in general have an obligation to the poor, this obligation consists of raising the poor above the poverty line rather than raising them to middle or upper middle-class status.

When chief wage-earners had successfully completed on-the-job training, they and their families would be given the opportunity to move into homes that would eventually become their own. By the time of their second move, families would be self-supporting and presumably acceptable, if not yet entirely comfortable, in a working-class environment. They would not be required to make a down-payment on their homes and would pay low interest rates during the first five years of their mortgages. If interest rates were set at, say, 2 per cent, their equity would tend to grow at a faster rate than if mortgages were granted at market rates. At the end of five years, when these formerly impoverished households would presumably be well established at a standard of living far above the poverty line, all public assistance would cease, and the interest rates stipulated in their mortgages would be raised to the prevailing market level.

By moving a second time, families would--if they so desired--be able to leave behind them the second-class status they might acquire during their initial effort to adapt to working-class life. While their permanent homes would also be located in working-class neighborhoods and their standard of living might not increase following the second move, the opportunity to own homes should re-enforce the desires of families to stay out of poverty and to remain in their improved position. Home ownership would constitute tangible evidence of both their rise from poverty and the possibilities newly opened to them. As a result, they might further increase their efforts to minimize the chances of sliding back into poverty.

But if a wage-earner could (or would) not successfully complete on-the-job training, he would be dropped from the program and both this training subsidy and his family's rent subsidy would be terminated. The only assistance he might receive would be aid in finding a new job. Similarly, if a family became unable to meet its mortgage payments during the first five years of their mortgage, their house would be returned to the government in exchange for a payment equivalent to the family's equity in the house. At the end of the first five years, however, the government would presumably sell the mortgage on the open market and any subsequent failure to meet mortgage payments would be handled in the normal manner.

e. Cost of the Program

The cost of instruction in the training camps might range between $5,000 and $10,000 per family, depending on the length of stay.* The federal government would probably bear from 50 to 80 per cent of the cost of providing each family with initial training. On-the-job training might cost $6,000 to $8,000 annually, of which the government might pay $4,000 to $5,000. Thus, the expense to the federal government of three years of training should be no greater than $18,000. Rent subsidies during on-the-job training might range between $50 and $100 per month; thus, the highest annual subsidy would be $1,200. The cash outlay required to provide permanent housing should be no greater than $20,000; however, the cost to the government of furnishing this housing cannot be measured by the cash outlay required. The cost is more accurately measured by the difference between what the government would have to pay to borrow $20,000 for five years and the rate of interest families would pay during the initial five years of their mortgages. If the government paid a 6 per cent rate to borrow the funds and families paid 2 per cent on their mortgages, the annual cost to the government would be approximately $800 per family. Thus, the cost of housing subsidies to families during on-the-job training and the following five years should be no more than $6,400. The maximum total cost per family for both training and housing is then estimated as $24,400. Although the program would probably be tested initially on a group of families numbering in the hundreds, a billion dollars would finance the entire eight-year sequence for at least 41,000 families and, assuming a 20 per cent drop-out rate, would permanently raise at least 32,800 out of poverty. To the extent that actual costs fell below the maximums specified in the above estimates, a greater number of families could be assisted.

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*The experience of the Bureau of Indian Affairs, which runs a similar program of relocation and training for American Indians, suggests that the annual training cost per family might actually be far below this estimate. The Bureau spends only about $4,200 [illegible]ally per family, but $10,000 was chosen as the highest conceivable maximum. See "Vocational Training Programs for American Indians", Training Facts, Office of Planning and Standards for Manpower Development, U.S. Department of Labor (December, 1964).

These estimated costs, however, are relevant only to the management of the federal cash budget; they do not give an accurate picture of the social worth of the program. To estimate the social worth of the program, social benefits must be weighed against the social costs. It was estimated that the social cost of three years of training might be as large as $26,000 per family ($10,000 for the first year and $8,000 for each of the two succeeding years). The social cost of providing a family with housing would probably closely approximate the cost to the government of subsidizing their housing and, therefore, might be as large as $6,400. Thus, assuming that 20 per cent of the families fail and that these failures are distributed at random throughout the first three years of the program,* the social cost of successfully raising a family out of poverty would total a maximum of $35,640.

From these expenditures must be deducted the cost of welfare assistance that would have been given to the family if it had remained in poverty. W. Irwin Gillespie has estimated that for families with annual money incomes of less than $2,000, 55 per cent of their income comes from governmental transfers. The corresponding percentage for families with money incomes from $2,000 to $2,999 he estimated to be 44 per cent.** Assume therefore that annual net welfare and public service expenditures on a family would have totaled $1,000 if it had remained in poverty. In addition to welfare and service expenditures saved, net tax payments (gross payments less the value of public services received) and investments by families in either productive equipment*** or the education of their children should be taken into account as items tending to offset the cost of raising them out of poverty. However, even if these additional benefits were accounted for, the rest of society would probably not find a $35,640 investment in a poor family economically worthwhile unless the most profitable alternative investment would yield a return of no more than 5 per cent. Of course, the cost of lifting a family out of poverty might prove to be less than this rather substantial amount, but any decision to implement a program such as this would probably have to be made on humanitarian rather than economic grounds. Thus, the question becomes one of whether this country is willing to reduce its total national income slightly in order to achieve a more equitable distribution of that income.

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*An assumed 20 per cent failure rate distributed at random raises the tota cost of successfully raising a family out of poverty by about 10 per cent, sinc it is assumed that on the average failures get only half-way through the progra

**See W. Irwin Gillespie, "Effect of Public Expenditures on the Distributio of Income", Essays in Fiscal Federalism, edited by Richard A. Musgrave (Washing D.C.: The Brookings Institution, 1965), p. 162.

***Through purchases of stocks or bonds or through loans to financial intermediaries.

4. Integration for Equality of Educational Opportunity*

We have suggested that racial equality is only one aspect of the larger problem of giving equal opportunity to the children of the lowest 20%. Most of the lowest 20% are not Negro, and with the present rate of rapid change toward racial equality, the problem of the lowest 20% should progressively whiten. If neighborhood prejudices should continue, by 1985 the problem of integration may be that of mixing classes within racially segregated communities. Therefore, in discussing "integration" I shall be concerned here with the broader question of class integration.

It would be comforting to some if we could achieve significant equalization without mixing our schools--if we could merely spend more money on the poor, and meet them after "they've developed." But recent studies suggest that facilities and techniques are not the answer, although teachers are part of the answer. The best chance for students with low socio-economic status is attendance at schools with higher-class student majorities. Evidence also suggests that very little significant equalization can be expected from the Head Start program.* Although one feels instinctively that programs of this type must help some, they simply reach too little of life. This report only confirms what we know of the weakness of technical solutions--which accounts for many of the disappointments of foreign aid. It takes many years of intimate contact for economically backward people to begin to have the behavioral characteristics of people in advanced economies.** But one should also note that there is little evidence that great changes will be made in the life chances of the poor by mixing, or that the well-off will really benefit from the experience. Both of these are soft arguments for which there is little proof. But if the nation wants to improve the chances of the poor, integration is probably the best way--and the costs need not be overwhelming. The lowest 20% is only 20%, and the flavor of even the most refined suburban school need not be disastrously changed by the addition of such a 20%. The author has attended several schools with this percentage of the lowest 20%, and the middle class students were little harmed, for they set the patterns. The long-range goal might be to have school populations throughout the United States with between 15 and 25% from the lowest groups. I fear that if middle class people are asked to send their children to a school with over 25% of the lowest groups, they would begin to alter their schooling arrangements or residence. The problem of achieving perfect balance of poor and non-poor in every school is difficult because of the settlement patterns of Americans. Some areas, such as the heart of the ghettos and the Kentucky mountains, are not and will not in the foreseeable future achieve schools with less than 25% from the lowest group.

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*See also "A Critique of the Proposed School Decentralization of New York City," Annex (i) to Part III, below.

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*James S. Coleman, Equality of Educational Opportunity, U.S. Department of Health, Education & Welfare, 1966, pp. 290-334, 491-523.

**Some nations, of course, have had these characteristics develop with relatively little culture contact (e.g. Japan). Others need to be taught.

The original method of integration was the establishment of the free public school, which as it improved in quality and availability tended to bring together larger segments of the community. The next step was the establishment of "Union Schools." Thus, a number of one-room school districts could pool their funds, provide a better school for all, and bus the students from outlying districts. Union Schools allowed people of different classes to find their intellectual level among their fellows. The larger Union School also afforded a chance for people of different levels of ability and types of personality to find fellows and teachers who were congenial to them, and thus to be stimulated emotionally to further achievement. Many students in the West go miles to grammar school and tens of miles to high school. Thus, "busing" is already an accepted means of integration in much of the country. Busing is acceptable partly because the larger school which busing makes possible offers more to the excellent student of whatever class. In some suburban areas the economically integrated school is a better school than the higher class school because it is larger and more diversified. Integration through union and busing is also acceptable in so far as the school itself is placed in a "respectable" neighborhood, the teachers are of high quality, and the numbers of really lower class children are not large enough to be disruptive. The achievement of these conditions in many parts of the Far West is probably responsible for the relatively high level of nonwhite achievement there.

On the other hand, busing is not the same thing as true neighborhood integration. Busing reduces the interest and contact of the parents of the lower class with the school of their children--it certainly reduces their responsibility for the school. Moreover, the value of the interaction of low class and middle class students suggested in the HEW study cited above may lie more in the interaction of friends outside of school, in the contacts of families in a neighborhood, in children meeting a different class of adults, than it lies in student contacts in school hours. In busing there is not even inter-class contact of students in transit to school--an important part of students' social life in many districts. If this argument is valid, then over half of the advantage of contact through integration is lost if the busing solution is adopted. If students are bused into communities which already have what is felt to be "enough" of the lower class, then there is real danger that the effect will be to change the busing's effectiveness by driving down the class level of the community.

However, the very problems of the busing approach may make it more acceptable to the middle classes. If the lower class children are only contacted in a supervised, institutional setting, the fears of the middle class that they may lose the pleasant, peaceful quality of their neighborhoods will be quieted. However, a recent study of New Haven suggests the temporary nature of busing as used there, and the small number of lower class children that they could successfully use in a middle class mixture.*

Let us, therefore, suggest the following approaches to equalizing educational opportunity.

1) Push college integration in the South, for the necessity of Southern Negroes to attend Negro colleges is probably one of the most important and easily remedied blocks to equality. Colleges are not tied to neighborhoods.

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*William L. Miller, The Fifteenth Ward and the Great Society, Houghton Mifflin, 1966, pp. 133, 254-255.

2) Support unified schools where these will result in improved education and improved mixing of social classes. "Busing" should not be through other districts but as the result of unifications of districts, even where this results in some gerrymandering of districts. The federal government might donate funds as interest-bearing investment to schools following a federal redistricting plan. Once a sum of money was given as a reward for this purpose no more federal money or control need be involved.

3) Provide federal grant incentives to school districts for redrawing district boundaries so that not more than 20% of the student bodies of any one school are going to be lower class, except where this would make the concentration of lower class children in neighboring districts even more extreme. The new districts may require more busing.

4) Make flat federal grants for investment to school districts in disadvantaged areas which agree to accept a certain percentage of high quality teachers, as defined by the government. By this means the cultural horizons and contacts of student will be improved, along with an improved welcome for the outside teacher by local staffs (who will also benefit from the new funds). However, the teachers will often be from out of state, and should be given generous moving and settling-in allowances. The standards and percentages of "high quality" teachers should be realistically adjusted to the area.

5) Offer federal guarantees of property values to middle class communities willing to rezone in order to allow low-cost housing (government subsidized if necessary) which will provide not more than 20%

of the children in any one school.[*] In addition, the government might work out ways to support firm zoning for the community for a period of years. This zoning will help to guarantee against further penetration by the poor. Because of the drop in the ratio of property values to school population, the government should also make grants to the district to subsidize teachers' salaries.

6) Place middle and upper income urban renewal projects within the margins of depressed areas in a scattered pattern. For such units it may be necessary to have subsidized rents below those immediately outside of the depressed area. School districts should be rezoned so that the lower class contingent is kept to the 20% level, for otherwise the occupants of the high-priced dwellings are not likely to use local schools.

7) Along boundary lines between classes or races, particularly where these boundary lines are changing, the government should guarantee property values. This will tend to arrest the decline of areas into the ghettos of the future. In these areas, the government might also encourage firm zoning regulations, so that it will be financially difficult for more than a small fraction of lower class people to move in. But the new zoning should at the same time allow 15-25% of the lowest groups to find quarters at reasonable rates. Because the quality of housing which is within the means of the lowest groups will change over time, zoning boards should have the right to upgrade their regulations every 5 years in some

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[*] A guarantee system similar to that of some corporations for their employees. The idea of guaranteeing property values was suggested to me by Frank Armbruster of the Institute.

definite relationship to the earnings of the lowest 20% at that time--thereby maintaining provision for a poor population of stable dimensions in each community.

We would hope that the housing aspects of the foregoing program would be improved relative to past programs. The federal low-cost housing developments of the past have tended to exacerbate the problem of income class separation. First, much of this money has been used to form or perpetuate large blocks of lower class people. Secondly, by maintaining income levels, the successful are weeded out as the projects mature, thereby further increasing the concentration of the lowest classes. Moreover, the institutional appearance--the open pipes and radiators and tiled halls--tend to further the selection of a hopeless, dead-end population for such projects. Currently many suggestions are being made for improvement in these programs, and they should help. It might particularly help to emphasize federal or local government support for building or renovating smaller units, perhaps more scattered in a community. One might encourage private enterprise developments of small cooperatives by guaranteeing mortgages for new or renovated buildings. Here, by putting in a little money, a large result might accrue. And by emphasizing low-cost cooperatives with growing equities for the owners the poor might take a greater interest in their dwellings and ultimately in their community.* If there is overcharging and overcrowding in some areas, a primary object of federally supported programs should be to reduce the demand for certain types of housing. This may be accomplished through the support of housing for people above the lowest income levels. This should reduce the density of the ghetto, and thereby spread its population more uniformly. Of course, if a large urban renewal program changes a whole neighborhood from low to middle income, nothing has been accomplished.

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*This concept was suggested to me by Robert Krupka of the Institute.

One of the costs of the suggested programs is increasing government control. We have tried to minimize this effect by making federal grant aid for investment, thereby giving the local district more autonomy after the proposed changes. Mortgage and property value guarantees also reduce the regulatory influence of the government relative to the desired social gains. Instead of breaking down zoning we are suggesting giving federal support to zoning under certain conditions.

Although primarily for educational benefit, the program outlined above might simultaneously attain slum rehabilitation, better housing and slum prevention--in a form which would be least threatening to the middle class majority. The questions now become, do we really want to accomplish these objectives? At what rate? At what expense? With what completeness? It would be well to point out that we are suggesting the attainment of a degree of equality of opportunity which no modern country has yet accomplished. Perhaps if the government could devise a long-range program for reducing by 75% the inequality of opportunity present in the country through educationally significant differences in the composition of school populations, the ability of teachers, or the composition of neighborhoods by the year 2000, this would be a sufficiently ambitious program.

We estimate that the proposed program might have a gross cost of about $4.0 billion (1966 dollars) a year by the time it got fully under way in the 1970's. If the program replaced, with the aid of additional subsidies, 10% of the housing units in the U.S. every 20 years, with a subsidy cost of about $10,000 a unit, this would mean an expenditure of $3 billion a year.* The subsidy might be given to a builder, a community, an owner or renter, and it might be divided in any number of ways. If the government lost on the guarantees of the property values of 100,000 units a year at an average loss of $5,000, this would cost $500,000,000 a year. If grants to districts were, in effect, to subsidize the salaries of 20% of U.S. teachers every year by $1,000, this would be $400 million a year. Since there would presumably be an overlap between the suggested program and present or other future education, housing, and renewal programs justified on other grounds, the net costs of the equality program alone would be lower.

But again we would like to emphasize that because of the indications of a relatively rapid advance for nonwhites, and the growth of educational opportunities everywhere in the country, the crisis which many sense in this area seems to be somewhat artificial. Going very fast in the direction of achieving educational equality may have costs in restricting the area of individual freedom of decision for the majority that may be more than should be reasonably borne. However, if we restrict our attention to economic costs alone, both the suggested programs could be easily carried by the national economy.

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*The paragraph on housing above (3-68 to 3-69) refers to general considerations in urban renewal, and only a part of this effort is being considered as ascribable to the equality budget for housing suggested here. We are talking about 6 million units in 20 years ascribable to this program. As an orienting figure for the low-rent federal housing part of the program, New York City received 7500 units in 1965-66. This would be 150,000 units on a twenty-year basis. A recent New York City report is asking for twice this number (The New York Times, Oct. 2, 1966, 1-73).

5. Some Alternative Considerations in Judging Training Programs

In this section we will consider the following issues:

a. The effectiveness of additional training for the already educated upon the opportunities of the lowest 20%.

b. The relative effectiveness of general over technical education in a rapidly changing society.

c. The possibility of character education.

d. Paternalism in career development as a positive mode of education.

e. The double effect of adult education, training and placement.

a. The Effectiveness of Training the Already Educated Upon the Opportunities of the Lowest 20%

Training programs for the poor are faced by a basic contradiction: the jobs for which the poor can easily be trained--within the constraints of their typical basic abilities, prior training and available time--are usually not well paying nor in high demand. This contradiction severely reduces the cost effectiveness of much government training, both from the point of view of increasing the individual's income and the productivity of the nation's labor force as a whole. In the spring of 1966 manpower shortages existed in two areas: (1) highly skilled and productive positions including both professional employees and skilled craftsmen, and (2) low-paid positions as hospital attendants, waiters, dishwashers, etc.* In attempting to meet these needs, 50% of MDTA training has apparently been for jobs in the latter group, and in so far as the training is focused on the lower classes, it will be mostly in this area.** Before money is spent for training for low-paying positions, we should ask why

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*Occupational Outlook Quarterly, May 1966, p. 26.

**Manpower Research and Training, Department of Labor, March, 1964, pp. 162 174. In 1963, over 60% of trainees had high school or better education--p. 21.

these jobs are not filled today, if there is unemployment. Most employers at this level could and usually do expect to do on-the-job training. These positions are not filled because the combination of availability of transfers, especially unemployment insurance, and the chances of earning more with fewer hours when working, make low-paying jobs very unattractive to a certain segment of the occasionally unemployed poor. This has two effects on training programs for these positions. First, trainees are apt to drift out of the jobs for which they are trained. Secondly, by reducing the pressure on the employers of low-paid labor to raise wages or to institute on-the-job training at their own expense, MDTA and other training programs are making it easier for employers to pay low wages. Why should the government reduce the bargaining position of waiters by training more waiters to work at low prices? Government training not only increases the pool of available waiters, but reduces the cost of waiter turnover to the industry.

An alternative approach is not to condemn but to applaud the diversion of training funds which might otherwise go to the poor, to enable high school and college graduates to obtain skilled or managerial positions at government expense. If the growth of the economy is being held down by labor shortages for high-paying jobs, then the government is likely to be able to add more value per hour of training here than at any other point of intervention. The poor may then be pulled into positions at the end of a chain of job changes starting at the top.* Even without the chain effect, increased productivity is likely to increase the demand for lower skilled positions.** By using this approach, the demand position of the highly skilled, who need it least, is weakened relative to that of those with least skills.

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*This argument was made convincing to me by Mr. Frank Armbruster of the Institute, especially his feeling for the effect of the G.I. Bill.

**Thus, historically increased productivity has generally led to increased aggregate demand. This is, however, not a necessary result.

Therefore, programs of training and education not directed toward the poor may be better for improving the position of the poor than programs directed toward the poor. If, for other reasons, we institute wage supplement schemes for low-paying jobs,* it will be more than ever necessary to throw the balance of training funds toward better paying jobs. Otherwise, we will have two programs simultaneously depressing the demand position of the poor.

b. The Relative Effectiveness of General over Technical Education in a Rapidly Changing Society

Attempting to predict future job requirements is very open to possible blunder. Technological change often proceeds more slowly than expected or reverses its expected effect on the job market. Today types of work which were apparently declining a few years ago, such as plastering, are making a comeback. On the other hand, the government now predicts that one of the fastest growing areas of employment will be in clerical occupations,** but with the rapid growth of computerized data handling systems, and possibly even mechanical secretaries, one wonders about this prediction. It might be estimated that 50% of the better paying jobs available in the U.S. do not require special skills, but they do require a basic level of competence which includes some mixture of native intelligence, education and cultural acceptability.*** The government can do little about the first, but I suggest that it could direct more of its job training effort toward the latter two areas. The Job Corps, of course, already uses this approach, but fairly expensively. Additional support of adult training in the evening, the method used by so many immigrants in years past, may be more valuable than much of the technical training given today. General education should include basic skills, knowledge of the local world, ways of dress and speech. In addition, subsidies for a person in general education of this type might be less because the person will often be employed, or in an on-the-job training program at a reduced salary, at the same time he is receiving adult training. It might be possible to have some employers promise improved wages to persons completing such evening programs.

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*See R.D. Gastil, "Toward a New Basis for the Evaluation of Anti-Poverty Programs," in HI-1006-RR, _op_. _cit_., pp. 70-86.

**_Occupational Outlook Handbook_, Bureau of Labor Statistics, 1966-67 Edition, p. 16.

***The superiorities of the American soldier and worker are probably more related to the relative breadth of their education and experience (and to relatively high motivation) than to superiority of technical education.

c. The Possibility of Character Education *

The analyses in accompanying papers have suggested that differences in motivations and behavioral culture among peoples are basic to the problems of the poor, and to their inability to give a fair chance to their children. Such differences may well be more important than technical training or general education in inhibiting productivity. In fact, without a new culture and character, a poor person will find it hard to identify sufficiently with the system to take advantage of education and job opportunities. In general, these types of blocks are not amenable to direct attack. However, some new approaches have been developed which might well be experimented with on a larger scale than previously.

Professor David McClelland has recently suggested the possibility that crash courses of a few weeks in thinking about one's motivation and potential can greatly improve the productivity of individuals.** Although his effort has concentrated on management and entrepreneurs in underdeveloped countries, in a modified form it might be possible to adopt this approach to the poverty context.

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*See also Annex (ii) to Part III, below ("Character Training in General Education").

**"Achievement Motivation Can Be Developed," Harvard Business Review, Nov.-Dec., 1965, pp. 6 ff.

Much of the approach of Arthur Pearl and Frank Riessman* is in fact a means of changing the attitudes and goals of the poor by providing a bridge between their life situation and that of the middle class. In a new and non-threatening job situation poor people may be able to develop a new set of values and attitudes. Another related approach to character education, which has achieved considerable success with delinquents, prisoners and addicts, is to use the persons with the character faults under attack as the trainers.** The necessity to identify with the new set of values in order to teach these values seems to be a very intense educational experience.

d. Paternalism in Career Development as a Positive Mode of Education

Putting a person in a good steady job and keeping him there is probably a more effective form of technical and character education than anything else that can be devised. However, as government programs come to concentrate much of their effort on the lowest 20%, they will find it increasingly difficult to translate training into careers for the poor. As mentioned above the Bureau of Indian Affairs has a program with some characteristics which might usefully be generalized in programs supported by OEO. The Bureau supports families in moving to a training location, during the training period, and follow-up training with repeated placements afterwards, for an average family cost of $4,200. They find that before the

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*New Careers for the Poor, The Free Press, 1965.

**Frank Riessman, et al., Mental Health of the Poor, The Free Press, 1964, pp. 509 ff., pp. 600 ff. This is also a basic Communist device for mass character training.

Indian settles down permanently he must, on the average, be placed in three jobs. In other words, what the Bureau is doing is using the job mechanism to support a process of adaptation, which is apt to be beset with many failures. But if the Bureau can help the Indian to persevere, in most cases he apparently attains a permanent job.*

e. The Double Effect of Adult Education, Training and Placement

Richard Muth** has pointed out the relatively high cost effectiveness of training programs for adults as compared to programs such as Head Start or even teen-age training, on the basis of the time-lag between training and maximum returns to training. One additional effect that he did not describe is the greater spread of the results of adult training as compared to training younger persons. If a father of three, thirty-five years old and working irregularly as a laborer, is trained to take over a nearly full-time skilled position at $4.00 an hour, the government has not only brought him above current poverty lines, but his wife and children as well. He will now be able to buy more books and newspapers, live in a better neighborhood. He will take more interest in the school and his children's achievements in school, for he will now be more accepted in the community. His example will show to his children and to himself the value of training and of working. Now, while it is true that Head Start programs try to improve the home through contact with the parents--especially the mother--such programs cannot approach the improvement in a home environment which results from a father staying in a steady job and thereby raising the family's income.

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*"Vocational Training Programs for American Indians," Training Facts, Dec. 1964 (U.S. Dept. of Labor) and BIA/USDI statement to subcommittee on Employment and Manpower, U.S. Senate, Sept. 16, 1963.

**"Appraising the Effectiveness of Programs for Reducing Poverty," IDA Working Paper, No. 12, Dec. 1965.

In addition, it may be easier to train adults of whatever class than it is to train teenagers. Experience after the war in the United States, and in adult education in Scandinavia shows that people in their twenties and thirties generally learn more rapidly than teenagers. Primarily this is due to their greater seriousness of purpose, combined with freedom from the tensions of working out the emotional problems of teenagers.

6. A Suggested Direction of Penal Reform

Reform of the penal system might offer considerable promise for breaking more people out of the cycle of lower class culture experience. A recent study suggests that in 10% of AFDC cases the jailing of the chief provider was the "crisis" which led to dependency.* In a full employment economy, especially as this might be supported by the family allowance plan suggested above, it would seem as though the dependency of the families of most of those imprisoned today might be avoidable. One way would be to provide prison employment at low wages, with nearly all of the earnings going to dependents. Another would be to use a day and night system, whereby the prisoner works at a regular job and lives at the prison only at night. What is suggested here is an acceleration of present trends in the penal system and in analogous institutions such as those caring for mental disease and deficiency.

Today the most common approaches to reduction in jail-time are expanded use of probation (especially of first offenders) and parole. These developments are part of a general tendency toward a more sociological "understanding" of crime, and include the provision of much more pleasant jails and more latitude in sentencing.[*] This has several unfortunate consequences. First, it reduces the disparity of attractiveness between jail and home, especially for the poor, and those marginally attracted by a more regulated institutional life. By giving the judge more discretion in the imposition of sentences, there comes to be a wide disparity between punishments for the same crime. Therefore, the more "advanced" systems of criminal punishment make it harder for the lower class person to feel that there is a predictable system of rewards and punishments which is fair to him.[**] His belief in graft, fate, and discrimination is thereby apt to be reinforced no matter how sound judicial decisions may appear to middle class adults. Finally, as leniency increases, the wrongness of illegal acts may appear less clear to the lower class community. If we expect the lower class poor to mature, then we should apply the same standards of expectations to them that we do to the rest of society.

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* M.E. Burges and D.O. Price, An American Dependency Challenge, American Public Welfare Association, Chicago, 1963, p. 40.

Instead of increasing the use of probation and parole to improve the responsibility and productivity of the criminal, it might be preferable to impose definite sentences outside of jail for most offenders under a system much more restraining than present parole or probation programs.

With the help of modern electronic gadgetry it might be possible to maintain a tight control over the majority of convicts while they led an outwardly normal life.* In this concept, the court would sentence most criminals presently sent to jail or placed on probation, to quasi-probationary or quasi-parole terms of varying lengths and degrees of severity. From our point of view this system would have several advantages over the others. First, there would be more flexibility in the employment opportunities of the convict. Secondly, he would be isolated from other criminals, measuring his daily life with a more standard society. Third, the adjustment to a more normal and consistently productive life after the completion of his term would be easier. Finally, the family would be kept together--at the very least this should reduce illegitimate relations during the jail period and stabilize the lives of the children. Present day in-jail training programs can be transferred outside of the institutional environment, and the convict may be required to attend such programs as a part of the conditions of sentence.

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[*] James V. Bennett, "The Sentence and Treatment of Offenders," The Annals of the American Academy of Political and Social Science, January 1962, pp. 142-156.

[**] Jerome E. Carlin, "Courts and the Poor," paper delivered at APSA annual meeting, New York City, September 6-10, 1966.

There is, of course, a cost to the society of diluting the mix of more upstanding citizens with paroled criminals. This is especially hazardous in terms of the already undesirable mix in some poor neighborhoods. If done competently, however, this may be a cost worth bearing because of the possible gains. Another problem would be that it might be operationally hard to make the threat of severe probation as deterring as that of jail. However, it is my belief that it could be made quite a deterrent. Some individuals would, of course, fear jail more and others fear the surveillance more.

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*Cf. the discusson of Alan F. Westin, "Science, Privacy and Freedom: Issues and Proposals for the 1970's," Columbia Law Review, June, 1966, pp. 1003-1050 and his Privacy and Freedom (Atheneum, N.Y., 1967). The suggested application of surveillance technology is certainly not Westin's idea, but I believe that if we make privacy a basic right as he does, the strength of this right is reinforced by restricting its abrogation to types of judicial sentences. The difference between life under surveillance and without can be made quite sharp with present technology. The same effects might be achieved without technology by using tighter controls than are now common in probation and parole--e.g. an approved detailed plan for each day checked at random.

In terms of the AFDC figures cited above, one might conservatively estimate that the primary reason that 4% of the poor are poor is current or recent penal incarceration of the chief provider. If three-fourths of the chief providers presently sent to jail could be handled in one of the ways suggested here, then the earning position and future prospects of 3% of potential prisoners and their families might be significantly improved by penal reform, and two-thirds of these might be in the potentially poor group. Another approach is to consider the jail population in 1960 and annual turnover. In 1960 the jail population was 350,000--50,000 of these were in for such short terms as to be unimportant here. Now if we consider that current poverty is affected at any one time by incarceration during the last two years, 300,000 is increased to 500,000.* Of these, one-fourth will continue to be incarcerated under any program because of danger to the public. Seventy-five thousand more might be considered to make no contribution to poverty because of financial or income status. If each of the 300,000 remainder contribute to the poverty of 3 persons on the average (self and two others), then 900,000 might be helped by suggested programs. If two-thirds were, then almost 2% of the poverty group would be significantly helped by such changes.

The cost of a proposal of this kind might be quite low. With 30,000 police employees, New York has 500 probation officers, and could use 1000 to carry out its present program well.* I would estimate 2000 would be needed for the proposed program. Nationally state and local governments have 378,000 police at a payroll cost of $169,000,000 a month. Rounding to 175 million, this is $2.1 billion a year.** In New York City probation officers and police officers receive comparable salaries. Therefore, the national figure at this salary should be an additional cost of $\frac{2100}{15} \times \frac{3}{4} =$ $105 million,*** which may be raised to $125 million to allow for salary increases. With $50 million of surveillance equipment the total cost should be $175 million. From this would be deducted the savings to present and projected prison systems, plus the cost of some additional overhead and supervisory personnel. If the effect on 2% of the poverty group is anything like I suggest above, the program may be worth it. $100 million per percentage point to get over the poverty line is probably cheap.

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*Statistical Abstract, 1964, pp. 156, 159. Some of the 55,000 in detention for juvenile delinquency would also be contributing to a family if outside (p. 157).

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*Bernard Collier, The New York Times, October 3, 1966, p. 41.

**Statistical Abstract, 1965, p. 442.

***The relation of police officers to probation officers in New York would be 1/15. Since there are one-fourth this number today, the cost will be only 3/4 of the gross cost of the program.

ANNEX (i)

A CRITIQUE OF THE PROPOSED SCHOOL DESEGREGATION OF NEW YORK CITY

Since "decentralization" can take many forms, and even the same form could have different consequences in different situations, it may be useful to take a specific situation, that of New York City, and to consider a specific proposal, the "Bundy Plan."*

Under the Bundy system the central board of education would direct all special schools, coordinate the districts, represent the system for budget and programming, perform central research and evaluation, and handle construction programs. The local district board would have responsibility for appointing district superintendents, principals and teachers, determining curriculum, selecting and authorizing text books, equipment purchases and school maintenance.

Thus, the proposed system would place most local decision-making in the hands of a local school board. This might appear undesirable, but the primary safeguards included are clearly stated, namely, that the central board of education has the right to transfer pupils from one school to another and the right to redraft district boundaries. The mayor would control selection of the central board of education and, in theory, be able to broaden and balance each local district board. In addition state standards would have to be met.

Some of the assets of such a system would include a good chance that such a system would actually arouse substantial parental interest. The new system provides a built-in complaint-handling system and forces community involvement. It relieves the red tape of decision-making which should result in schools being "light on their feet." Parents and students would probably develop a proprietary attitude and the principals and teachers would have to defer to the community as they do in the suburbs.

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*Report of the Mayor's Advisory Panel (McGeorge Bundy, Chairman) on Decentralization of the New York City Schools, 1967.

The plan has been proposed because of clamor in some districts for more local control, and because there is a general feeling that the quality of education is declining. Actually, however, New York City has been faced with a declining relative and perhaps absolute "quality" of its population when measured against a middle class standard. Improvements in transportation have made it possible for the middle classes to progressively abandon the city and yet derive economic support from it. In regard to public school population the situation is even more extreme than in over-all population. There are a number of reasons for this. First, the lower classes have larger families. Secondly, those middle class persons who desire families, and especially large families, tend to move to the suburbs. Finally, many wealthier New Yorkers enroll their children in private schools.

This deterioration of the middle class share in the New York schools is likely to be extremely hard to reverse. For lower class families and lower class children are different behaviorally from those of other classes. Let us note, for example, the following summary of some of the ways in which lower class children tend to differ from those of the middle class:

1) show little respect for property
2) place greater weight on sexual ability and techniques of aggression

3) have a more opportunistic attitude toward law and order; authorities are to be feared

4) place less emphasis on marriage, divorce or the conjugal family

5) have marginal fathers and maternal dominance by a working mother

6) are not as closely watched by parents

7) do not emphasize cleanliness as much

8) do not emphasize school achievement as much

9) more likely to have distrustful parent-child relationships.*

If these behavioral tendencies characterize the lower class student, no matter how good the school may be academically, the middle class parent is going to be reluctant to keep his children in schools with high percentages of lower class children. We suspect that a school with one-third really lower class is too lower class for many middle class parents. For most of the middle class, 50% lower class is probably too many. But the more those who feel a third is too high move their children out, the more those who fear 50% will come to feel forced to move out, and so on. Without expressing it this way, this is often the process that rolls through a neighborhood, and sometimes a city. If this is not a racial but a class process, it is hard to say that the parents are wrong in their individual decisions. Yet the whole process tends indeed to trap the lower class in their poverty.

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*Summary of relevant points from Clyde Kluckhohn and Florence Kluckhohn, "American Culture: Generalized Orientations" in Conflicts in Power in Modern Society, Harper, 1947, pp. 106-129. Similar descriptions may be found in many recent discussions. We are, of course, describing not the verbal reports of lower class parents, but the behavioral tendencies of the cultural group. This difference is not racial but situational. For example, Jerome Cohen points out a very similar pattern of behavior characterizing the depressed Arabic, especially Yemenite, Jews of modern Israel. (F. Riessman, et. al., Mental Health of the Poor, Free Press, 1964, pp. 135-136.) See also Note 1, p. 3-100 below.

In the light of the foregoing analysis it should be fairly clear that there are so many social reasons for the decline in educational standards that the school administration might well be improving as the schools go down. Children with the behavioral tendencies and living situation described above for the lower class are going to do more poorly in school than middle class children even if we assume that the native intelligence of the two groups at birth is precisely equal. For one thing, the disorganized nature of lower class life is apt to force upon them lower attendance, more of a tendency to drop out. Teacher quality is also likely to drop steadily, particularly in ghetto schools (although admittedly an exceptional principal or other factor will cause outstanding teaching staffs to continue to characterize a small minority of ghetto schools). First, most teachers know how to deal more creatively with students from well-regulated homes and with as high motivation to achieve in school as possible. Secondly, teachers most often want the general goods of middle class life. In particular, they also want to bring up their children outside of the city, and they strive to obtain positions closer to their suburban homes. This particularly affects the number of teachers available for lower class areas in which the Panel's report suggests most teachers teach only because they are forced to if they are to obtain regular positions in New York City schools. Finally, of course, the report points out that the availability of good teachers has been decreased by the relatively low competitiveness of teachers' salaries in today's job market.

The foregoing suggests some of the reasons [illegible] the quality of education of the lower class urbanite is declining. But let us look at this same point from a little different angle. A recent nation-wide study of educational achievement points out that achievement is primarily related to the characteristics of one's fellow students. In particular, it is a student's fellow students' educational background and aspirations which is most predictive of his success. The preparation and quality of a student's teachers was found to be the next most important factor. All of the other factors of differences in facilities and methods added up to relatively little.*

Integration of classes is, then, the most decisive factor in improving the performance of students. As the Coleman report puts it (p. 310):

> "If a large part of the effect of a school on a student is accounted for by the achievement level of other students in the school, then in a segregated system, if one group begins at an educationally impoverished level, it will tend to remain at that level."

Unfortunately, the decentralization proposal before us admits that segregation is in fact increasing in New York City, and that attempts to desegregate the schools have had, and are likely to have, relatively little effect in the near future. Indeed, the Negro community has seemed itself to turn away from this goal, or at least its most vocal representatives seem to lay much less stress on integration than they did a few years ago. For New York City they may be right. First, one might estimate that if the student population is already over 50% Negro and Puerto Rican, this may mean that perhaps 50% of the total public school population in New York City illustrate the lower class tendencies described above.* For the reasons stated above, this lower class population is going to be a hard group to integrate in class terms without further alienation and dispersal of the middle class population. Secondly, Coleman Report figures (Table 3.3.1) suggest that unless Negroes attend schools with more than 50% whites, integration is of little value to them. Although this is racial not class integration, and in spite of some controls may result partially from extraneous factors, the result seems probable, because the majority of students will tend to set an educational and social tone in a school which will be reflected in the achievement of all but a very small minority of isolates.

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*James S. Coleman (ed.) Equality of Educational Opportunity, Office of Education, 1966, pp. 302-319. The text mentions corroboration in other studies. See also Bernard Berelson and Gary Steiner, Human Behavior: An Inventory of Scientific Findings, Harcourt, Brace, and World, 1964, p. 439. A little intuitive reflection on the differences between schools, including colleges, should also help to confirm this result.

Improvements in teacher quality can be of considerable importance in educational improvement. Yet the attractiveness of teaching in lower class areas is going down. It is an unpleasant but understandable fact that although they show little prejudice, the brighter, more competent teachers generally prefer to teach high achievement students (Coleman Report pp. 356-364). The Panel's report indicates that New York teachers are increasingly rebelling against work in lower class Negro and Puerto Rican schools, while parents in these schools are demanding more teachers from backgrounds closer to their own. These parents or their representatives may also be further reducing the attractiveness of their schools by demanding that expulsions for misbehavior be reduced, and indeed that the power to expel be taken out of the hands of teachers and their representatives.

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*We have estimated that 3/5 of the Negroes and Puerto Ricans in the schools are lower class and 2/5 of the whites. Even if this is high, the State Educational Commission's Advisory Committee on Human Relations and Community Tensions report on "Desegregating the Public Schools of New York City" suggests that there may be 70-75% Negroes and Puerto Ricans by 1980. Thus the tendency is certainly to the direction of 50% lower class figures.

The Panel's report seems to be more a response to changes in the political-social rather than the educational situation. It is a response not only to local pressures but to a national change in attitudes and desires, particularly among the poor. This change is, of course, not primarily self-generated by the poor. As this report indicates a great deal of the involvement of the poor has resulted from the efforts of those who involve them. However, the lower classes are chronically dissatisfied, particularly in an achievement-oriented society. Members of the lower class can easily be led to feel acute dissatisfaction with their society or with themselves. They are not equal in many things, including educational achievement. They are also not equal in the number of positions on police forces, on school faculties, school boards, supervisory positions. Some of their leaders, white and Negro, want to change this situation and they want to change it now before these groups can win through the electoral process the local, state, or national power which would be necessary to force these changes through the normal political processes. In some cases political or class groupings are such that they see no chance of winning this power "legitimately" as the Italians or Irish before them. Their leaders would, therefore, like to break up the local organization of power into units at least some of which the poor and segregated can control. It is necessary to stress that this "rebellion" is more against paternalism and majority control than against low school performance. Low school performance is rather likely to be used as another proof of majority misbehavior. In this highly politicized and emotional context such evidence as we have presented above on the difficulty of improving performance in segregated schools is not going to be admitted to the discussion.

It is into this educational, social and political environment that the plan for a decentralized system has been introduced, and in these terms we must extrapolate what we think it may achieve.

There are many ways in which the plan for district emphasis could be made to benefit the school system, especially in the longer run. In the right context people who have power often learn a good deal of responsibility from the exercise of power. The proposal for decentralization suggests a feeling in its authors that by granting power through the districts there will be a kind of "working through" of the excessive emotions generated by the black power movement. They believe that while at first it may be important to have a black teacher, as the lower classes begin themselves to take responsibility for the quality of their children's education, they will realize that it is more important to have a good teacher than a black teacher. If this is the correct scenario, then the district approach may lead through a process of withdrawal and return to the eventual improvement of ghetto education. Through acquiring self-respect the lower classes will attain a new vantage point from which integration will again seem a positive goal if it can help the children.

If the poorer districts, as proposed, could mount a really effective national recruiting campaign for teachers who want to teach in lower class schools, and if ghetto teachers could continue to be hired on a quality basis, albeit revised, then the effects on student achievement of continued segregation could perhaps be overcome. The Coleman Report (cited above, p. 318) suggests that teachers who do not want to teach lower class children are not as effective in teaching them as those that do (or at least those who say they do). If the competitive position of the poorer districts can be raised sufficiently, and screening be made more effective, then that type of teacher who does not like to work in this environment could be gradually eliminated with positive educational results. If the salaries for good teachers are raised sufficiently, and the number of those excellent principals who attract good teachers increased in these areas, then many teachers now living in the suburbs might be induced to commute back to schools in the ghettos. Yet the numbers of high-quality teachers needed is large, and we cannot expect that idealism will be enough to obtain them.* To attain these goals principals and teachers must be offered both high salaries and definite guarantees as to working conditions and tenure. The suggested districts may find these hard to provide.

The foregoing positive scenario has already been suggested by the Mayor's Advisory Panel in this report. They have also reviewed some possible problems. But we feel that the Panel's understanding of the situation may not have been sufficiently responsive to the implications of the present social and educational context for forecasting the educational results of districting. On balance we feel the districts are unlikely to improve education in the poorer areas of New York.

We believe that although the Mayor's Advisory Panel makes occasional admonitions in support of integration, the district idea will only support present tendencies in the opposite direction. Let us mention several reasons for this. First, as the CONSAD districting report suggests, attaining ethnic diversity will "be at the expense of the other criteria."

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*Nationally the Coleman Report's survey of prospective teachers concludes:

> "...there is no indication in these data that the better trained, brighter teachers will become engaged in the teaching of the underprivileged to the extent that would be necessary to compensate for disadvantage in their environment." (p. 357)

In particular, the desire for a "natural community" is apt to work against the mixture of groups which might otherwise be attained through districting. There is an assumption in the proposal that the Negroes will want Negro teachers and principals, the Puerto Ricans, Puerto Ricans, etc. It is suggested that in Negro areas there may be courses in African culture and in Italian areas courses in Italian culture. If districts are seen in this way, and if 50% of New York public school children are lower class, then the middle class, non-group adherents in a school district are apt to move into other districts or take their children out of the public schools. For district schools will become educationally somewhat specialized schools for a special clientele, what many of them have already become socially. Even the fear that this will be the direction of movement will enhance district homogeneity. Thus, in an already marginally desegregated district, a small movement toward ethnicity in education may lead to a disproportionate effect.

Our guess is that the presumed tendency for the districting plan to enhance segregation by ethnic groups within the city will also be reflected in increased segregation by class as well. This will be true for several reasons. For one, there may well be a move toward greater integration by race in the suburbs at the same time that there is greater segregation in the inner city. The last really effective barrier preserving segregation (zoning for expensive homes) will be economic, and more and more Negroes and Puerto Ricans are crossing this barrier. Secondly, many middle class Negroes and Puerto Ricans while they may sympathize with their racial fellows, have a more than average desire to bring up their children in a middle class atmosphere. If whites are forced out of many districts, this will mean that many middle class Negroes will feel that this has hurt the life chances of their children whether or not they have read the Coleman study. For it is likely to have negatively affected the middle class composition of the student body as well as the racial composition.

If the evolution of the suggested districts is as we suggest, then the teachers these districts are apt to obtain are going to be predominantly the more inferior teachers. If today, most teachers who teach in lower class schools do so because they are forced to, and if personnel policy is to be controlled by the districts, then most teachers now teaching in these lower class districts will tend to apply at as many non-lower class district offices as possible. Only if they are refused in other districts will they return to a lower class district--i.e. the bottom of the barrel will freely return. The proposal suggests that the attitude of the district's people toward their teachers will be a more positive one, because the teachers will be the ones the people of the district have chosen. This may be so, but equally important is the fact that the pool these districts will choose from may be a poor one indeed. It may be a wider pool than today, but generally not a very distinguished one unless extreme efforts are made. There are idealistic teachers, but they are evidently a minority. Moreover, one expression of their idealism is to strive to teach with a good principal. Yet it is quite likely that local control will often come into conflict with the retaining of principals high in the esteem of teachers in ghetto schools. Finally, the desire for teachers of one's own race will conflict with quality education, at least at first. Any artificial principle of selection such as this will reduce quality by reducing the pool (which is one of the main economic arguments against segregation). This is the more so, when the number of trained Negroes and Puerto Ricans seems to be as insufficient as the report suggests. Although there are provisions in the proposal to force districts to maintain state standards, there are ways to circumvent these provisions, as there are today ways to circumvent New York City standards. It may be politically very inconvenient for the State Commissioner of Education to intervene against districts which circumvent state standards, if this means blocking the jobs of nonwhites.

We have suggested above that it would be possible to improve education through concentrating funds on obtaining excellent superintendents, principals and teachers, and through waiving racial standards of choice. However, there are a number of reasons to doubt that this will be done as consistently in lower class districts as would reverse the process of polarization we are describing. There is a good deal of evidence from analogous CAP-type programs supported by OEO that lower class people suffering from a good deal of unemployment tend to use access to funds to expand employment roles to the maximum limits. In fact, this is not a problem of CAP, but a world-wide characteristic of poverty politics. A related tendency which is right for a CAP program but may be wrong in educational districts will be to confine district employment as much as possible to the residents of the district. The proposal specifies the possibility of the districts appointing "teaching assistants" and "paraprofessionals." These are positions well thought of in OEO circles because of the opportunities they offer for the involvement and career development of adults in the ghettos. Yet we would imagine that a proliferation of such positions might in lower class school districts leave little excess money for the concentration on obtaining top professionals which we would think educationally desirable.

If we think of the implementation of the district proposal over time, one can imagine an initial period of struggle and euphoria. During this period the idealists and the local power advocates will try to exact as much power as possible from the central administration. There will be a sincere attempt on the part of many teachers and of some supervisory personnel to make their communities understand what is in the interest of their children, and to take advantage of the subsidiary parts of the proposal--such as the elimination of the city examination system--to increase quantitatively and qualitatively the pool from which New York City schools can draw. At the other extreme, the more traditional majority of teachers and supervisors will try to slow down the development of the new system, and, failing that, preserve for themselves their former world of professional control in the relatively more middle class districts.

Very soon after this stage we are likely to see the system sort itself out with the results described above. The suburb-like areas, i.e. the more middle class districts, will have the best working conditions for teachers. Here teachers and supervisors will retain approximately the same position they have today--for these are not the districts clamoring for district control. Education in these districts may be a little superior to today's, for they will be able to more freely choose their teachers from a broader pool, and since they are more insulated, they will seem relatively more desirable to teachers than the whole system does today. In addition, breaking the examination system may help them in the ways suggested by the Panel's report.

In the lower class districts the loss of the initial euphoria and sense of struggle will mean that many well-meaning educators will have found that what they wanted was not what the lower classes really wanted, that the new holders of educational power were at least as difficult to deal with as the old. This will be followed by an over-all decline in the quality of teachers available in the poor schools and by a decline in educational performance for this and other reasons cited above. Outside of the educational establishment, however, this failure in the ghettos will be masked for a time by the fact that a few exceptional districts or schools in lower class areas will be able to work out a superior program, and at least temporarily will raise or appear to raise educational performance in these areas.

Irrespective of its educational achievement, once in, the district system will have many defenders. First, the majority of votes will remain with middle class voters, and these will demand a reasonable allocation of money to their districts. Since these districts represent the majority of taxpayers, if this is not done, there will be a more general tendency to reject school tax increases and send children to private schools. But assuming they get a fair share, middle class districts will probably like the new system at least as well as the old. In the lower class districts, however, the chance for jobs and advancement, for power and participation offered by the new system is likely to form a strong political force in favor of the new system. If the students are continuing to achieve poorly in these districts the parents may rebel. But even this check may be weakened by the dynamics of the new system. For example, through claiming the right to educate "their way," lower class ethnic districts may progressively do away with those standardized examinations which make comparison possible, or interfere with the publication of their results. This tendency may be supported by those, well-meaning or otherwise, who will not want the new system questioned, as well as by black nationalist advocates who can easily point to those ways in which the most diverse kinds of tests and teaching materials are slanted to favor white, middle class children.

In sum, the new system will be supported, just as is the present system, by those it benefits most directly, i.e. those employed directly or indirectly by it and able to achieve advancement through it. Experience suggests that after the initial period of enthusiasm, control by parents will be stronger in the middle class areas than in the slums, for these parents have over the years shown a more consistent interest in education and in their children.* Moreover, in these areas parent and teacher are in fair agreement now. In lower class areas there is liable to emerge _de facto_ control by a certain group of educational leaders who have learned to work with the leaders of the lower class who can prevent those outbursts of opposition which can be threatening to their positions.

We would predict that the process will essentially be halted here and not go on to a thorough reliving of the process which led to centralization of the schools in the first place (i.e. a full-blown spoils system and reactions to it). We do not believe that the doubt of the proposal's authors that a spoils system could arise again is sufficiently supported by the context in which we believe the decentralization must occur. For we believe that the apparently strong safeguards built into the proposal could be fairly rapidly eroded by waivers of requirements resulting from the desire to mollify minority groups. We do believe, however, that corruption is less naked today, and therefore less likely to be checked. Thus, while a few scandals could easily lead to a demand from all sectors of the community to restore centralization, we believe that once the levels of local power suggested in this report were achieved, it would be difficult to reverse the process.*

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*Cf. Note 1.

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In conclusion, we do not wish to take a position against the report of the Mayor's Advisory Panel. We feel that many aspects of this report are probably educationally correct (e.g. the correction of the examination system). We also feel that a measure of decentralization might be helpful in the political and social development of the underpriviledged groups which now make up the New York City lower classes. We feel, however, that there may be insufficient realism in the appraisal of the relationship of this general desire to the improvement of ghetto education. There is, for example, little comparison in this report of alternative degrees of decentralization, nor of the relative advisability of starting the decentralization of New York City power in areas other than education. For in more than any other area, the children of the ghetto have a right to the most nearly equal educational opportunities in which the city, state and nation can provide them. The highest chance of attaining this goal in the short run may be to continue to cause the decisions for their education to conform in all vital respects to those for the city as a whole, for this is the society in whose terms the ghetto child must compete for a chance at higher education and a good job.* Today, in many neighborhoods, the school and its faculty is one of the few contacts for the ghetto child with the dominant middle class world beyond. We feel that a too rapid decentralization of educational responsibility may only end in eroding the significance of this contact as residential segregation has worn away so many others.

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*A possible trend toward more far-reaching decentralization of city organization is discussed in Note 3, pp. 3-109 to 3-111 below.

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*Further development of this point may be found in Note 2, pp. 3-102 to 3-108 below.

NOTE 1. Motivation for Education of Lower-Class Parents

The Panel explicitly states that:

> "The underlying premise of...this report is [that] intense parent concern for their children's education exists; if that is not acknowledged there is no point in the first place in reorganizing the school system to increase community participation."

We agree that this concern exists in general, but we believe it varies between middle and lower class children in such a way as to perhaps invert the desired results of decentralization.

We would like specifically to take issue with the Panel's assumption that the lower class parents are really greatly interested as a group in the education of their children.* The literature suggests that many lower class parents express great verbal interest in education, particularly when talking with those who they feel to be representatives of the middle class. But we feel that in the terms of social science jargon their "behavioral culture" is quite different.

Evidence for this conclusion comes from a number of sources. The Coleman Report points out that for whites and oriental Americans parents' interest in the child's education seems to be more significant than for Puerto Ricans, Indians, Mexicans or Negroes (predominantly lower class groups). They concluded that either the latter children were unable to report parents' interest accurately, or the parents were unable to translate this interest into "effective support." There appears, in particular, to be a good deal of unreality in the reporting of both Negro children and perhaps in the parents as well (pp. 301-302). Many lower class persons realize what they "should want" for their children, for they live in terms of two cultures, a problem which Hyman Rodman has discussed as the "Lower-Class Value Stretch" (in Louis Ferman, et al., Poverty in America, 1965, pp. 270-283).

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*We realize that this is a common assumption of many educators concerned with these questions (for example, in John Beck and Richard Saxe, Teaching the Culturally Disadvantaged Pupil, Charles Thomas, 1965, p. 264), but believe that it is based on exceptions and/or verbal reports.

Seldom do lower class parents try consciously to deceive interviewers or others as to their interests. Most of them would like their children to become professionals, their daughters to avoid pre-marital pregnancies, and so on. Many of them make real efforts to achieve these goals. But for success the effort required is more than they are able to put out. As parents they do not live according to a life style that makes this possible, and nearly every contact in their neighborhood weighs against their children really taking these middle class verbalisms seriously. In a homogenous lower class neighborhood it is as though there is a conspiracy to make these middle class verbalisms into mere prattle. Giving "power" may help; involving the parents in PTA's and district school elections may help--at least the mothers can be induced to come at first. But that this will result in the kind of sacrifices in personal life style and in adherence to rational purposive choice that comes so easily to the middle class, we doubt.*

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*My own experience, as an anthropologist, with people of poverty is primarily with American Indians, though I also spent a year living in Iran and a year in Pakistan. But I think it is significant that so many American Indian groups have had involvement and political power for years, generally with such trivial results.

NOTE 2. A Discussion of Some of the Dangers Arising from Neighborhood Control of the Schools in New York City

by Frank E. Ambruster

The idea of a decentralized school system with emphasis on neighborhood schools and, for that matter, neighborhood school districts, is generally good. It may lead to better cooperation between parents and the teachers and to more control by the parents of the education of their children. A basic aspect of our social and political system is the idea that the education of the children is primarily the responsibility of the parents.

However, I believe there is an absolute requirement that all children in the school system of the State of New York, regardless of their background, meet the minimum requirements for the grade that they are in. Deviations from these standard requirements can only do harm to the children of the most underprivileged of our community. Regional school districts in the City of New York may tend to increase *de facto* segregation, but even more important, they may tend to lower the standards of the children in the schools of the less prosperous neighborhoods. This would be a criminal outcome. For there is a good deal of evidence that the difficulty in getting jobs experienced by Negroes today is influenced as much by their inability to read and their lack of education as it is by discrimination. These statements are important for two reasons: first of all, they are important for determining the level of education required by the underprivileged, and second, they are important in defining for all parents the problem of the school system. It would be unfortunate if the proposed decentralization of the New York City schools be allowed to create a decade of inferior education for the underprivileged of New York. The children are simply too important. It will be the next generation which will have to pay the costs.

Let us consider some of the points in the Panel's report which inspire the fears which I am expressing. The report suggests that teachers should "pay as much attention to the learner's feelings and concerns as to the subject matter." In many lower class districts this principle is likely to be enthusiastically adopted, but such enthusiasm could easily be used to "justify" the lowering of the standards of what subject matter is taught in the schools and what the children are required to learn at each grade level. This could have a very bad effect for several reasons. First of all, it may be a mistake to take a small Negro or Puerto Rican child and put him in a school which automatically treats him as though he were "different" from his white counterpart. It is quite true that his environment is undoubtedly different from that of most of his white counterparts, but he himself should not be made to feel that he is different. In the schools of the Negroes and Puerto Ricans where often the family unit has broken down or perhaps never existed, much extra work will be needed by these children to meet the standards of the grade in which they are enrolled. It is essential, however, that they understand that they must meet the same requirements as any other child, regardless of the color of their skin or their nationality. It is quite possible that these children may have to be given tutoring and help with their homework for an hour or two each night in the school building. Oftentimes it is impossible to study in the disruptive environment of their small apartments. But they must do their homework and they must keep up. This requires superior teachers to cope first of all with the problems of these children in the areas of discipline and even cleanliness that they may not have learned at home, but second, the teachers must be so dedicated, intelligent, well-qualified, and endowed with patience and judgment that they can skillfully handle their normal work routine during the day plus the extracurricular problems they will have to handle in the one or two hours after school has officially closed. If in addition to having all these qualifications the teacher also has to be Negro or Puerto Rican or some other special group, the probability of finding enough teachers to do this extremely demanding job is almost zero.

The probability is, however, that there will be a large number of special group teachers brought into these areas and the probability also is that many will not be the best qualified teachers.* They will undoubtedly know much about the learners "feelings and concerns" but probably have an inferior knowledge of the "subject matter." It is the knowledge of the subject matter which will determine whether their charges are able to earn a living in the future for which the school system is presumably preparing them.

The assumption in the Panel's report is that "if Negro teachers don't perform, Negro parents will want to get rid of them just about as fast as incompetent white teachers."

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*Even today the only male Negro and Puerto Rican school principals (there are four regular female Negro school principals) were appointed without passing the normal examinations, probably because of direct or indirect pressure from these ethnic groups.

There are, of course, great dangers in this attitude. For one thing, even if we assume that these teachers will eventually be removed if they are incompetent, the question is what happens to the children in the meantime? How can they get along in the future grades if they do not learn these fundamentals? What happens to this precious resource--the children of the city--in the grades that follow and, for that matter, in their future lives? Furthermore, the probability of things going smoothly enough to allow these teachers to be quickly removed is quite low. The assumption here is that the parents of these areas will rise to the occasion and one should not doubt this. But the real question is how far can they "rise" as a group. In this kind of environment it is quite possible that the parents, or at least those who are badly educated, can be strongly influenced by irresponsible leaders, particularly if to oppose them means to incur the title of handkerchief head or Uncle Tom, a traitor to one's race.[*] Under these circumstances all kinds of undesirable procedures could be forced onto the local Negro school board and replacing a Negro teacher, particularly with a white teacher, may not be nearly as easy as the paper supposes. Furthermore, if the Negro with demanding "middle class" values is identified with "whitey," less demanding "lower class" values may be identified as really representing the Negro "culture," and radicals may demand in effect that the school system be brought down to that level.[**]

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[*] Such slogan-generating demagogues should not be underestimated; under their influence even Martin Luther King was lead into some strange positions.

[**] The emphasis on the "different" Negro background of these particular American citizens, by teaching African history in the schools rather than relying on American history to present a cultural background for all citizens, not only points out again the "difference" of the little Negro child but might tend to facilitate the selling of this "different" less demanding Negro "culture" to the uninformed Negro himself.

Even elements with no interests in the betterment of the lot of the underprivileged of the city, but with a great interest in continuing the disruption of these communities for ulterior motives, may find themselves in a better position to control the development of events among the relatively uninformed, unorganized "ethnic" parents of the slums. Furthermore, in this milieu it may not be easy for white (or perhaps even Negro) teachers to enforce the kind of discipline which is necessary in all schools, but even more necessary in these schools with large numbers of children who have such an unfortunate home environment.*

In this environment the establishment of autonomous school districts which will often coincide with ethnic groups in the City of New York might not only be a less-than-optimum method of solving the problems of New York City schools but may prove to tend to perpetuate a deteriorating city fiscal situation. The Panel's report refers to the great cost of educating "the children of the poor." This is undoubtedly going to become a larger problem as time goes on. Within the next ten years, probably 60 to 65% of the children attending schools in the City of New York will be Negro or Puerto Rican, while only 35 to 40% will be children of non-Negro or Puerto Rican background. Unless the techniques of these Negro and Puerto Rican schools are rapidly improved, it will mean that the poor of groups which make up the vast majority of the students in the city schools will be those which require a large amount of money to educate. Currently one can imagine a disproportionate amount of money flowing into these "ethnic" school districts, particularly since the "taxability" among these groups is quite low. The system as visualized in the study, however, may tend to perpetuate that situation. Unless these groups can receive an intensive education which will make them competent to fill available middle class positions, they will not be able to bring up their income level and therefore their tax potential.

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*Like the immigrant child resident of the slums of yesteryear, who had to learn the language and adapt to a new culture while performing the normal school work in order to "make it," the current slum-dwelling child may have to learn to discipline himself to work harder than most of his middle class counterparts.

A bit of pessimism might lead one to visualize by 1977 a very expensive group of Negro and Puerto Rican school districts with relatively low qualifications in subject matter. These districts might be characterized by great disruption, due to constant shuffling and changing of teachers and administrative personnel while the system attempts to "find itself." One can also visualize irresponsible elements trying to link activities in the school system to anarchistic principles of behavior supposedly aimed at betterment of the black man in this country. At the same time one can visualize the other 35 to 40% of the students in the New York City schools getting the benefit of relatively smooth-running schools and responsible parents cooperating in both the running of the system and enforcing the discipline required to meet the normal middle class standards of the nation. Such conditions would greatly widen the gap between the education received in lower class Negro-Puerto Rican school districts and the others. Students from these "separate but unequal" parts of the system might be even less likely than they are today to meet the requirements to enter the science high schools. One can also see rabble-rousers among the underprivileged groups insisting that it is not the fault of these groups that they are not getting their children into these high schools, but rather the result of a middle class, white plot. There will always be those who will believe this, for it is hard to say mea culpa and accept things for that reason. The real victims, of course, would be the children of these areas if this should occur. They may have to pay the price of ten years of experimentation with the only system capable of implementing their escape from their slum environment. But the city will also pay a high price eventually, if a generation of one class of the poor should have a substandard education in a time when education determines to a greater and greater degree on 's standard of living.

NOTE 3. The Possibility of School Decentralization Triggering a Much More General Decentralization of City Government

by Max Singer

One interesting possibility, if the decentralization proposal of the Advisory Panel is adopted, is that decentralization in schools might lead to decentralization in other parts of the city government. There are two basic ways in which decentralization in schools can tend to lead to decentralization in other aspects of city government: the force of example and precedent, and particular political dynamics.

Although for any aspect of the job of government there are obviously advantages and disadvantages of both centralization and decentralization, careful analysis of the relative advantages of these two directions of movement seldom appears to accompany choice of one or the other. Nevertheless, since the nineteenth century there has been a general city-wide choice for centralization. Since the city has reached a high level of centralization today, decentralization becomes an available tactic with which to respond to various needs such as a desire to look as if something is being done or the need to shake up a department. This may be particularly true if the things that the local constituencies want are politically difficult to grant because of opposition in other areas. Where this is true, the only way out of the dilemma is a system in which local option has more sway. (In effect, this is part of the explanation of the decentralization of the school system.) Once any part of the operation of the City of New York is decentralized, it becomes easier to consider decentralizing some other part.

There are a number of motivations for decentralization which will apply with different strengths in different areas of the city government, and for different people and points of view. Analytically some of the motivations for decentralization in a system of city control would appear to be the following:

1. So that strong areas might forge ahead without being held back by the majority.
2. So that the weak areas might fall back without dragging down the rest.
3. So that unit competition will stimulate improvement throughout the system.
4. So that diversity will permit imagination and creativity and new ideas will develop.
5. Because of a belief that "local government is good government" (where "local" means a small enough area so that the citizens _feel_ that they are having an influence).
6. Because of a belief that the key factor in city government is having an understanding of the local situation (therefore, "local" government will produce better government).
7. Because of a belief that any shakeup in the present administrative machinery can't be anything but beneficial.

It is important to realize that this particular proposal stems from a general belief that "local government is good government," or, more generally, a feeling that it is a legitimate demand of many local constituencies that they have more say in their lives.* This demand is especially strong in lower class areas and applies to welfare programs, transportation, police, business and schools. The school decentralization program is in many ways a direct response to this desire of the poor ethnic minorities of New York. But what comes next? It is common political experience that to meet a desire under pressure may result in one of two things: satisfaction of those complaining or increased pressure in the same direction. If the degree of decentralization granted really resulted in better schools, there would be a chance for the pressure to cease. But in the body of the paper we suggest it will not. If not, then the continuing wide gap between apparent promise and reward for the lower classes is apt to increase the pressure for decentralization in an ever wider group of city functions.

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*There has been considerable interest in this direction of development of New York City for some time. One need only cite the "Citizens' Union Program for Community Planning" (_The Searchlight_, July 1947) and their more recent "A Program for Community Districts" (June 1964) published jointly with the Citizens' Housing and Planning Council.

There are a number of possible political mechanisms tending to move in the direction of decentralization as a result of the adoption of the particular proposal of the Mayor's Advisory Panel to decentralize in the educational area. Within one of the proposed districts an educational leader can develop political strength through his success in improving the schools of that district and running them in a way that the district likes. This political power can be enhanced by an ability to do favors within the school system as a result of broad district control over finances and personnel. Such a person might then try to use his influence on other city activities within his district. That is, he might try to influence what the Parks Department, or the Police or the Streets Department, etc., do in his district. First, presumably, he would be concerned with small things which might be either of a "good government or reform" character, or primarily a matter of doing favors to build up political support. The effectiveness of such a leader in terms of his ability to influence actions of other city departments might come from either or both traditional political skills and the ability to understand and work effectively with city agencies, or a kind of blackmail ability based on exploitation of the ability to produce riots or demonstrations if thwarted.

NOTE 4. General Remarks on Solutions of Inequality Through Segregation

Decentralization is, we feel, productive of segregation. The solution to the problem of the inequality of the opportunities of races in the United States which is receiving additional attention today is that of equality in segregation. There are a number of reasons for this. First, many of the new generation of Negro leaders are finding that they can get more attention by appealing to a segregated Negro audience than by making an appeal which could be successfully brought before a larger audience. Another reason is that in so far as integration is successful it tends to allow the white community to siphon off the most talented leaders of the Negro community, while the bulk of that community, left leaderless, may be forced to move at a much slower pace. Moreover, if the object is Negro power for the reform of local conditions, then that power may have to be concentrated in ghettos. For in communities with racial feelings, a minority may not, in fact, be able to exercise power through holding a "swing vote." The minority may simply lose on every issue.

Part of the Negro desire for local power may be due to a realization of the facts of discrimination. And if Negro power can ask for and demand large infusions of federal money, technical advice and so on, then the schools, stores and housing of Negro communities should gradually achieve parity. This would be particularly likely if the black bourgeoisie who have moved out of segregated living could be enticed back in to try the experiment. But why should a Negro doctor or entrepreneur on the outside, dealing with a larger and more wealthy clientele, move back into segregation? Why should he send his children--those which the colored school badly needs for the improvement of its atmosphere--to a ghetto school, when he can have them mix with equally or more cultured children in a suburban school?

In fact, the Negro community would probably find it very difficult to provide opportunities to succeed materially on a segregated basis which are equivalent to those it is gradually winning on a partially integrated basis. A large part of the lack of opportunity within the ghetto is ascribable to the low productivity of the ghetto rather than to exploitation. The people of Appalachia have political power. In Eastern Kentucky the officials are all natives, and yet the level of education is disastrous and jobs few. If the mountaineer goes home to Kentucky, and he often does, he finds little discrimination against his accent and his habits. Yet his movement is generally outward. There is not the local capital nor the local leadership to stimulate revival, for these are drained off to more enticing prospects as soon as they occur. In a segregated but free Negro community there would, of course, be more political positions open to Negroes. But the sense of inferiority of even free ghettos in relation to the larger society would be little reduced by the possession of local power.

We can only conclude that unless American Negroes find themselves in a society as rigidly segregated as South Africa, it will be harder to increase the rage of achieving equality through black control of local areas than through integration of classes, including white classes.

The data cited above suggested that the problem of injustice is not so much one of inequal opportunity for equal ability, but one of the development of ability. If this is so, then the source of the equalization of ability must lie in the reform of educational opportunity. However, the major study cited indicates that differences in curriculum and facilities make almost no difference in learning. It also suggests that, in any event, facilities and curriculum are surprisingly equal already. The quality of teaching staffs accounts for a small but significant part of variation in educational achievement, but the real differences in achievement are ascribable to the socio-economic, and particularly educational, background of the students and of their fellow students.* This result verifies an earlier study of 35,000 seniors in which it was found that: "...no matter how privileged or underprivileged the kind of family from which they came, seniors at least double their chances of scoring in the top fourth in aptitude if they attend a school where most of their classmates are from the upper strata. The more well-to-do students there are in a high school, the higher percent planned to go to college", from all classes. Colleges apparently can also be differentiated more by students than by what is taught.** In other words schools find it very difficult to overcome the cultural inheritance of their students through teaching; but they do much more by class mixing. In our terminology, a result is that mixing of the children of the lowest 20% with other classes in school would do more to improve the salable abilities and thus the opportunities of these children than any other reforms in education. This means that the Negro, Indian or poor American should not be concerned so much with the upgrading of his schools, or with the "justice" of allocation of teachers by race or class to his children.* He should be concerned with attaining better educated and smarter teachers. But he should be primarily concerned with getting his children into a school in an environment which is as nearly upper middle class as possible--whether this is black, white or mixed.

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*Equality of Educational Opportunity (Summary). The tables in this summary are more decisive in the judgments than the text. A more detailed discussion may be found in the basic volume, James S. Coleman, op. cit., pp. 302-319, passim.

**Quoted from Bernard Berelson and Gary Steiner, Human Behavior: An Inventory of Scientific Findings, Harcourt, Brace, & World, 1964, p. 439. High School material based on Natalie Rogoff, "Local Social Structure and Educational Selection" in A.H. Halsey et. al., (eds.) Education, Economy and Society, Free Press, 1961, pp. 241-51.

If the problem of equal opportunity must be solved through a more or less racially integrated society, then the greater the degree of racial and class integration, the more equal the opportunity is likely to be. In general, it would seem obvious that the poor person in the rich community has much better opportunities for health services, education, information, recreation, and so on, than in the poorer community. Of course, adjustment may be more difficult, friends fewer, and possibility to achieve leadership positions and status in the community much more closed, especially from the viewpoint of the parental generation. The solution for many aspiring Negroes is to try for black, middle class surroundings, rather than attempt life in situations truly integrated either by race or class. This may be a good solution for them but it does little directly for the nonwhite lower classes.

Let us suggest some considerations in balancing cost and justice in the war against inequality. First, the costs to the current generation and those of the next must be distinguished, for society judges that the current generation is more justly condemned to inequality by its position in society than the next. Yet the two are hard to distinguish, for what we condemn this generation to may affect the next almost equally. Certainly we are all agreed that the teachers of the poor and of poor areas should be improved. Somewhat less agreement is available on the equalization of health services, essentially achieving socialized medicine by one route or another. Most believe that housing should be made as available to Negroes as to Whites--that is, at the same rates for the same housing.

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*Actually the Negroes would probably be better off if there were fewer Negro teachers. While in the short run a Negro teacher of equal training and ability can probably teach the Negro child more easily, the average Negro teacher is not so qualified, and moreover, preserves artificial barriers which cut off further exposure to a richer world.

So far, we have considered programs which will only cost the affluent society money. There can be other and more important social and psychological costs to the middle classes. There is less agreement on those types of equalization which will change or which it is thought likely to change, the quality of life for the middle classes, or which, alternately, would directly interfere with the family life of the poor. Although the study of education cited here indicates that it does the lower class child more good to be in middle class surroundings than it hurts the middle class child, this is not apt to be very comforting to the middle class parent. If it has a chance of hurting the life chance of his child _at all_, he is likely to oppose the mixing. However, as long as the child is allowed to stay in a poor home or neighborhood, in the meaning of poverty we have suggested here, his opportunity will not be equal or anything like equal. The most direct approach to this problem would be to take the child out of the poor home and place him in another. Less radical solutions are to spread the poor throughout the nation's school districts on a rough quota system.

ANNEX (ii)

CHARACTER TRAINING IN GENERAL EDUCATION

The liberal education of a child begins in a formal way with nursery school and ends sometimes after college, perhaps in graduate school. Here I want to contrast the general liberal education of the child with a more specific education in particular skills for particular jobs. The discussion will be focused on one particular aspect of a general education, its effect upon the character of the child, but in the process some more fundamental problems of evaluating education and of deciding upon appropriate goals for an educational system will be discussed.

Basic Problems in Evaluating Educational Systems

Most systems are improved by an examination of what is often referred to as the feedback of the system. For example, one may continually improve the equipment in a factory by examining products on a fairly objective basis, seeing what works and what doesn't work. In education, on the other hand, one is often faced with a problem of not knowing what the significance of the feedback is. I think a few examples will make clear the nature of the problem which I am addressing. First, we are all acquainted with the fact that formal education is directly related to income, on the lower and middle income level at any rate. Yet it is not at all clear to which extent this increase in the income is actually related to increase in productivity. There are several reasons for this. If one has an education he will naturally try to choose a person for a position next to him who has a somewhat equivalent education. A person naturally values in others what he has, and disvalues those that do not have what he has. We see this effect more clearly in examining other countries in which rather artificial educational systems have historically been used, and to some extent are still used today, as filters for entry into higher status positions. Americans involved in foreign development, for example, often see these systems as blocks to development. For artificial standards keep down some of the most capable people, while others are artificially kept in higher positions.

Another cause of an indeterminant evaluation of liberal education is the fact that if there is a large pool of persons from which it is possible to draw candidates for positions in the economy, and if it is necessary to have some rather broad general requirement for the selection of these persons, then it is very natural that one should base selection upon education. Certain jobs will require a tenth grade education, others an eleventh grade, others a twelfth grade. If the market gets tighter, then of course more employers will be satisfied with the eleventh grade; if the market is looser, if lots of people are available, perhaps some years of college will be required for the same job. In one generation we were satisfied that mail carriers should have a grammar school education; in another generation it may be they will need a high school education; in another, a college education. In fact, of course, the actual job may not have changed in the interim. Milton Friedman, for example, discusses a number of occupations in which the occupation has, for the purposes of exclusion, deliberately developed what he considers artificial educational values, but in this case mostly in the area of vocational education.

In conclusion, then, we have requirement explosions in terms of requirements of higher and higher education to meet availability explosions in terms of more and more people having education of higher levels which in turn leads to the correct assumption that to get higher positions one needs more education. Since in our society there is a broad correlation between IQ and years of education this is perhaps an easy and not too inefficient way to select people with relatively high IQ's, relatively high motivation and so on. I am not suggesting that for certain jobs more education is not required, or that it would not make an individual more efficient in that position. However, I am suggesting that there may be positions in which schooling is not relevant or indeed may even hurt the performance made possible by education from artificial requirements and artificially raised educational requirements.

The second reason why we cannot tell very much about the effectiveness of our educational system, and particularly its liberal or general elements, is that the people most interested in education (just as the people most interested in medicine, or truck driving, or other areas) are naturally the people who spend full time in that area. In other words, the evaluators of educational systems are the teachers and the educational administrators, the people who receive their income, their status, their meaning in life from education and from the adoption of certain types of education, the pushing of certain principles of education. These are the authorities, and they, then, become the authorities and the sources of knowledge on education for the people who have to go through this system. They develop a system which educates people to be receptive to the education being given to their children and so on. For example, the teachers who have gone through a school education whose teachers were very influenced by the ideas of John Dewey, will then teach those ideas directly and indirectly to their children through their methods and through their judgments in a school system. Students who have gone through that system will then become more receptive to their children receiving the same ideas and using the same methods in their school years. In fact, for hundreds of years it was an unchallenged assumption that Latin and Greek were basic to education and if one's children learned Latin and Greek they were being taught correctly. The father could quiz his children on these subjects and feel that a great deal had been accomplished in school if they could recite verse in Latin and Greek. Then, of course, new fashions came along and people suddenly started asking the question as to why they should be spending so much time on Latin and Greek when there was so much else to be learned which would be more relevant to the present time. Although we pride ourselves on rapid change today, in fact the fads and fashions of the last century are very much in evidence in education today.

This leads to the question of the fashions and status appeals which are central to education. They should, I think, give us pause. In every social science and humanity, and these all have their versions at the kindergarten level, there have been in the last century many fashions, great swings from interest in social reform, activation of the pupil, involvement of the pupil in the crises of the day, to a feeling that what we really should have is a completely scientistic approach with no emotional involvement. Involvement could come later, or outside of the classroom, or somewhere else. Each generation thought that it was right at the time, and its members became crusaders for their particular educational philosophy, for what particularly they thought should be taught. To come back to the feedback issue, they thought, of course, that the product they turned out was ideal. If, for example, a sociology course turned out a person who examined any issue dispassionately, who wanted to "see the studies" and so on, then they had indeed achieved exactly what they were trying to achieve. But, if, on the other hand, their students came out with a fiery interest in race relations and tended to speak in terms of absolutes, with emotional overtones on every statement, and a selection of facts to prove a particular side of the argument, then the teacher and the system would feel that they had failed with that student, that he had missed the point of the whole system. But since the teacher and the system may have been wrong in the beginning, we are faced again with the indeterminacy of evaluation in education.

It is possible, of course, to measure some things. One can construct operational definitions of achievement in certain areas. We can teach a list of words and then we can test the student's ability to spell those words. But in many areas we are not sure what levels of competency we really should want and how important they are relative to others. For example, how important today is the speed of a pupil's ability to recite multiplication tables? How does this compare with his ability to draw a picture, to use color, to form a vase, to understand what is going on in South Vietnam? There is a good deal of evidence, for example, that intelligence tests are developed by intellectuals for intellectuals, and that a great deal of what is important in the mental functioning of individuals is not touched upon at all in intelligence tests. For example, the IQ of decision makers may often not be nearly as high as that of the people who work for them, their staffs, and their investigators. And yet, these decision makers are able to function more satisfactorily in the society than the people with higher IQ's. They have more money, status, and perhaps "fulfillment." There is almost nothing in the educational system, however, that is really relevant to the development of the decision maker, of the man of action. This might be put in another way. Is it not perhaps a mistake to make so much of the intellectual IQ abilities of an individual in school and not prepare that individual for the decision-making role as well. In other words, should we not offer the intellectual more time to develop his non-intellectual abilities and less time to develop his strong points. Most of what a man is, it seems to me, is not measurable by the school system. And yet, to a large extent the man is being directly or indirectly formed by that system.

Another problem which society faces in evaluating education systems is the possibility of educational charlatanry. There are many reasons for this that are well known. First, the explosion of information reduces the objective possibility of a personal understanding of the concepts being used. This is a particularly difficult problem for the decision maker who must choose between many demands upon his time and many definitions of what is a reasonable approach to education. He tries to find some objective indicators of what is the really professional approach. One of these is, of course, degrees from important institutions, but others may be less useful. For example, difficult writing or other complexity in composition seems often to be accepted as a positive support of the concepts being put forward. In other words, incomprehensibility may not be taken as a negative characteristic of an educational theory, but is rather taken as a positive one, for no one wishes to admit that he does not understand what is being propounded. This is, of course, the old problem of the emperor's clothes. Finally, charlatanry feeds upon the fact that we have a larger and larger segment of the population receiving college degrees and even graduate degrees. Many of these people are not, in my judgment, able actually to handle the verbal concepts which they are being given. They do, however, come to have a kind of easy and superficial ability to deal with these concepts and to receive them and to respond to them as though they knew what was being presented. By using the right catch words such persons can be easily convinced to follow current fashions, many of which are in the nature of educational frauds.

In conclusion, I think that this problem of evaluating educational systems is pointed out most dramatically by a recent study by HEW of educational differences in the United States as judged by objective performance. The study was meant to find out the differences between races, and the degree to which discrimination, poor facilities, and segregation results in the low attainment of the non-white segment of the population. As you all know, however, what it found out was that the main determinant of performance was the characteristic of one's fellow students. Secondarily it was the ability and training of the teachers. Variations in methods and facilities had almost no correlation with the objective performance. Now, of course, it can be said that much of what modern systems claim to accomplish is not going to come out in these tests. For example, I would imagine that a very liberal educational system at the high school level might produce lower performance on an objective test, but ultimately higher performance by the individual, let us say, in graduate school. Therefore I am not saying that the HEW study proves the irrelevance of methods and facilities, yet I think it is an indication that there is a great deal more of simple fashion and simple self-delusion in educational controversy than is often imagined.

The Loss of Boundaries in Liberal Society

The second problem which faces the liberal society is the loss of boundaries or limits in our liberal society, especially as the society develops in the latter half of the twentieth century. I think it is fair to say that except in a passing technical sense art forms no longer really exist in our society. Poetry may be said to be everything that isn't prose. Painting may be every application of paint to a surface that is not strictly for an instrumental purpose. The novel may be any stringing of words together in any order with or without the context of an over-all story or theme. Even in prose we find the concept of "probes" which make it unnecessary to relate thoughts consistently one to another. Pure expression, the dream sequence, the schizophrenic artist have become the models of a society without models.

We might speak of an accompanying desocialization of urban society. To some extent this is a process which has always gone on with people who have come together in large urban centers. It is a process with many positives, many good things about it. But it seems to me that perhaps in our present society, the process is going further than it ever has before and involving a much larger segment of the public than previously. It is commonly remarked that almost all people who try to be different are in fact conforming. They are conforming to new and changing traditions, but are very carefully trying to fit into these traditions. However, the individual today, while he may conform in the various roles he plays in life to certain traditions, has a choice among a wide range of alternative pattern mixes which reduces constraints upon him to a point much lower than it ever has before for any large segment of the population. In other words, if one looked at New York City a hundred years ago he would find a large variety of alternative patterns. Cultural mosaic characterized urban society in medieval Islamic society. However, if one grew up in a lower middle class, Italian, Catholic neighborhood in New York a hundred years ago the likelihood of feeling constrained to a rather narrow range of choices was much higher than it is today. Today the Italian, the Catholic part of one's background may be quickly overthrown and become meaningless. The lower middle class part may become largely irrelevant.

This irrelevancy of constraining patterns is very much reinforced by the often noted reduction in parental authority. What is happening here is very closely parallel to what happens in a primitive society when it comes into contact with a more advanced society. The result is often referred to as "acculturation." In an acculturating society the individuals are inclined to a rather disorganized existence. Here we find the social breakdown which characterizes many parts of the world today and characterizes many rapidly changing situations. The children find the recommendations, the skills, the morals, the attitudes of their parents largely irrelevant to their present situation. The parents, moreover, feel that to a large extent they are irrelevant to the situation of their children. Therefore, there is a breakdown often accepted on both sides of the ability of the parents to form the character of the children. The children's character is formed by the situations into which they come in direct contact. For American Indians the result is often alcoholism, apathy and other forms of social breakdown for the younger generation. It may well be that as our society changes more and more rapidly in the last half of the twentieth century, this problem which was common to a primitive society which had to jump hundreds of years of change in a few years will also become a general feature of our society. Changing situations and opportunities will call into question everything the parents were taught. The parents will have left only their faith in progress. They will increasingly come to agree with their children that there is very little of value to transmit between the generations.

Another support of the breakdown of limitations and boundaries in our society is the weakening of economic constraints. As our society becomes wealthier and as getting a minimum subsistence becomes easier for the young, the ability of the old people to regulate the marriage of their children, the education of their children, and other personal decisions of their children by the threat of the withdrawal of economic support becomes vastly weakened. Similarly, the ability of the husband to regulate his family to prevent divorce by the threat of withdrawal of economic support from the wife and children also is greatly weakened in this kind of situation. Finally, of course, another support of the breakdown of boundaries is the fact that with new contraceptive devices, particularly contraceptive drugs, there is a freedom in sexual relations which was never possible before. It was the fear of pregnancy which held together the parents and their children in a general opposition to widespread premarital intercourse. Without this fear it is very much more difficult for either the parents or the children to understand why they should be limited in this regard.

We do not know what is the result of living in a society in which boundaries are breaking down to the extent being described here. It is very difficult to make a rational argument for the maintenance of any of the boundaries which we have talked about, whether it be an aesthetic boundary or a social one. Yet when the picture is looked at as a whole we see the evolution of a new type of existence which would appear to be extremely ambiguous in its implications. It is possible that this freedom, this breakdown, this subjectivization of standards may result in the birth of a more truly rational world, and may in fact, ultimately solve many of the problems in personal relationships that have seemed, up until now, unsolvable. The old society of constraints was not perfect and often led to psychological breakdown of various sorts, to sadism and brutality. Yet many of us have seen individuals and have read of societies in which the limits, the boundaries, appear to have broken away and the people are left adrift rather than free. It may be that this lack of predictability, this lack of limits is the last thing that man can stand, or live in terms of. It may be that creativity in the arts requires boundaries and forms and constraints within which it can develop. It may be that too much freedom leads inevitably to a flight from rationality, to a flight from unpredictability, to the foundation of truly totalitarian societies founded upon great myths which are more than ever repressive because the elite knows that these _are_ myths which guide the society rather than actual realities.

The Development of Character Through General Education

Nevertheless, in spite of the tendencies in the situation that we have described, the school has the responsibility now to take some interest in the formation of the character of the students which are given into its care. Four alternative attitudes toward what the school should do for character training are the following:

1. The school could pretend to be completely passive and neutral. The school would not, by taking this attitude, actually play no part in

the formation of character; it would, however, probably contribute the maximum to the formlessness of society and make the greatest contribution to the general erosion of boundaries.

2. The school could try to form the character of students according to the vision of the "educational authorities" of the day, of the ideal character which they think should be developed. In some periods this might lead to a result approximately the same as the first, but in others, and in certain localities, it may lead to extremely rigid development.

3. The school could try to form the character of students in terms of the past, in other words, it could try directly and indirectly to act as a drag on change. The school here would play the role of a "conservative stabilizer," a role often played by the church in the past.

4. The school could try to give the character training which the majority of the parents in the locality appear to desire. This is closest to the ideal of the traditional American school.

Now it is possible for a school to either directly or indirectly attempt to form character; however, given our present pluralistic society, and the present degree of formlessness in our society, probably few school administrations will try directly to form the character of their pupils. They must concentrate their attention upon the indirect formation of this character. Aside from the character of the student body, which the administration seldom controls directly, the indirect influences of the school seem to me to come from two directions. First, of course, is the type of teacher which is selected. The emphasis here might be upon the type of liberal education, particularly at the college and graduate level, which the teacher has had. The characters of teachers will, of course, rub off on their students. Many students see their teachers as alternative models which they can adopt in case of parental inadequacy. The second main type of indirect character formation comes from the structure of the educational system. By this we mean everything from the way the students are seated in the classroom to the type of tests they are given, to the ways they are rewarded or given status within their classes.

As to the content of character training, the preferred choice of the schools is likely to be the second alternative. Schools are apt to push for and try to develop the kind of character which educational authorities of the time believe is most ideal. These educational ideals will be compounded of the fashionable psychology, philosophy, sociology, literature, economics and so forth currently or recently taught in colleges, and particularly in schools of education. As we suggested in the beginning, the result of choice here will be a continuing subjective evaluation of the goals of education. Another result will be that these goals will be only vaguely related to the means to achieving them, for the situation is such that there is very little useful information or feedback on the relationship of means to goals. In other words, we will have a situation in which currently fashionable goals are being pursued by currently fashionable means, with very little evaluation either of the adequacy of these goals or of the relationship of the means to the goals.

The first need, it would seem to me is to examine more objectively what the characterological effects of different selections of indirect influences upon pupils may be. One item of particular relevance here is the question of statistical spread. In other words, it may well be that system X produces 10% excellent characters which could not be produced by any other system, but on the other hand it has negative influences on the majority of pupils. System Y, on the other hand, produces fewer persons who, from a characterological point of view, are particularly excellent. All of its products are characterologically flawed to some extent. Yet, on the other hand, this system has a generally positive influence on the majority of its products. In other words, there are questions here not only of what types of characters are most important, but of what statistical outcomes one wishes to have in terms of the various products of a system. For no system is going to produce only what it wants to produce, while all systems will force individuals into alternative paths in different percentages.

The second need, it seems to me, is for educators to try to decide what the characterological role of the school should be in the rapidly changing situation which I have tried to describe--in a situation in which boundaries are breaking down in a continuously acculturating society. It may be obvious from this discussion that I personally feel the schools should examine the possibility of playing the role of a cultural stabilizer. In this way they could at least hold together the generations and make more usable the experience and information of the parents to the children. In doing so, I would suggest they would make the lives of both more meaningful. However, the point of this discussion is not to support this personal opinion but rather to suggest an examination of some fundamental problems in education which I feel are relatively little examined in the public media, and perhaps not sufficiently examined in the schools.

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PART FOUR

IMPLICATIONS OF LONG-RANGE ECONOMIC PROSPECTS FOR U.S. EDUCATION

By

John Karlik

TABLE OF CONTENTS

Page

One Side of an Interrelationship. 4-1

Education Variables Subject to the Influence of Economic Conditions 4-4

The Effect of Economic Conditions Under Each of Two Unlikely Possibilities 4-5

An Attempt to Project the Actual Course of Developments 4-11

Detailed Projections of Student Populations and Education Expenditures. 4-32

Conclusion. 4-38

List of Figures

Figure Page

1 Index of Food Prices Relative to Average Hourly Earnings in Manufacturing. 4-13
2 Index of Cost of Clothing Relative to Average Hourly Earnings in Manufacturing. 4-14
3 Index of Rental Value of Housing Relative to Average Hourly Earnings in Manufacturing 4-15
4 Index of Cost of Electricity to Consumers Relative to Average Hourly Earnings in Manufacturing 4-16
5 Index of Cost of Medical Care Relative to Average Hourly Earnings in Manufacturing 4-17
6 Index of Cost of User-Operated Transportation Relative to Average Hourly Earnings in Manufacturing. 4-19
7 Index of Cost of Purchased Local Transportation Relative to Average Hourly Earnings in Manufacturing . . 4-20
8 The Declining Work Week 4-21
9 Railroad Revenue Per Passenger-Mile 4-23
10 Domestic Air Revenue Per Passenger-Mile 4-24
11 Trucking Revenue per Ton-Mile 4-24
12 Railroad Freight Revenue per Ton-Mile 4-26
13 Oil Pipeline Revenue per Ton-Mile 4-27
14 Domestic Air Freight Revenue per Ton-Mile 4-28
15 Average Cost of Electricity to Industrial Users Consuming 200,000 KW-HR per Month 4-29
16 Telephone Toll Call Rates: New York to San Francisco . 4-30
17 International Cable & Telegraph Rates: New York-London (Relative to 1947-49 Wholesale Prices) 4-31

List of Tables

Table Page

I Consumer Expenditure Patterns. 4-21
II Projections of School Enrollment to Year 2000. 4-35
III Number of Students Enrolled in Public and Private Schools 1975, 1985, and 2000. 4-35
IV Enrollment by Public and Private Schools to Year 2000. 4-36
V Economic Indices 4-36
VI Resources Available from Private Consumption Expenditure for Support of Private Education 4-37
VII Resources Available for Public Education to Year 2000. 4-37
VIII All Educational Expenditures 4-38

IMPLICATIONS OF LONG-RANGE ECONOMIC PROSPECTS FOR U.S. EDUCATION

The evolution of the U.S. economy during the next thirty or thirty-five years will inevitably have an effect on the character of American education. While this truism holds regardless of the particular course the economy follows, some economic developments, such as the wide-scale introduction of automation and a consequent leap in productive capabilities, might produce a near revolution in education. On the other hand, if the rate of economic growth slowed substantially or if aggregate output tended to stagnate at a particular level, the impact of economic conditions on education would be very different. The following discussion outlines the likely consequences of each of these possibilities, but discounts both as extremes likely to bracket the most probable outcome. This intermediate outcome and its effects on education are then described in some detail.

One Side of an Interrelationship

The rate and direction of U.S. economic growth help to determine the behavior of Americans in terms of the amount and type of education that they acquire. Conversely, the range of skills that are available partially governs or, in some instances, limits economic growth. Of course, a multitude of non-economic factors also help form educational patterns, and the level and composition of aggregate production reflect many inputs besides the various abilities of the labor force. The following analysis, nevertheless, focuses on a particular subset of these interrelationships, i.e., the possible impact of economic conditions on American education throughout the remainder of the 20th century. This particular set of relations is selected for initial consideration because the impact of external factors on education seems to be of more immediate concern to OE officials than the diverse and indirect ways in which educational patterns will influence the course of economic growth.

Because only one side of the interaction between economic activity and education will be considered, the portion that will not be discussed--along with the consequent implicit assumptions--must at least be outlined briefly. The following approach implicitly assumes that shortages of workers possessing particular skills will not impede economic growth and that any such shortages will be quickly eliminated through increases in the relative incomes of persons having these skills. Secondly, it is assumed that the educational and skill qualifications of the labor force will be adequate to support the level of aggregate demand and rate of economic growth that are determined by investment and saving. In effect, throughout this paper the level, growth rate, and composition of aggregate production are considered to be determined exogenously, and the effect of these variables on education is then examined.

For a number of reasons this "demand oriented" approach is probably the most useful and relevant way for U.S. officials to view initially the economic aspects of education policy issues. A "supply oriented" approach, by contrast, would entail detailed projections both of the need for particular occupations and skills and of the availability of persons with these qualifications. Educational planners would then attempt to persuade individuals to change their plans in such a way as to eliminate shortages and surpluses. Even if such an effort to match manpower requirements and availabilities falls within the legitimate activities of the Office of Education, it is questionable what the ultimate objective of this balancing should be or in which direction the Office should attempt to influence the economy. For example, should these efforts serve national defense objectives, should they encourage a more rapid rate of invention and technological innovation, or should they relate to some goal based on social equity? Thus, in a country like the United States that has no generally accepted national economic plan, government officials might well prefer to assist workers in their individual responses to the skill demands established by the aggregate economy rather than attempt to alter the direction or rate of growth through the availability of various types of labor.

Even in non-communist nations that do attempt to follow a national economic plan (such as France), attempts to project manpower requirements and likely deficiencies have not been particularly successful. Only in the medical sector have the French been able to utilize employment forecasts in preparing official training programs.* The sources of error in predictions of net manpower deficiencies include shifts by individuals from the occupations for which they were trained into other employment, unanticipated technological developments and consequent changes in job requirements, and market processes that alter either the rate at which labor productivity grows or the substitutibility of labor and capital.** Thus, long-term governmental education policies must be directed towards general objectives, such as broadening the background of students in mathematics and the fundamentals of science to increase their occupational mobility or providing more extensive instruction in liberal arts to help make the use of leisure time personally satisfying. Any general objective, however, cannot be dictated by the Office of Education but must follow the development of American society and the consequent demands that social evolution places on the educational system. To some extent these demands are determined by economic conditions; it is the likely influence of these conditions that is the subject of the following discussion.

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*Claude Vimont, "Methods of Forecasting Employment in France and Use of These Forecasts to Work Out Official Education Programmes" in OECD Study Group in the Economics of Education, Economic Aspects of Higher Education (Paris: OECD, 1964), p. 239.

**For a somewhat more extensive discussion of sources of error see ibid., pp. 239-41, and William G. Bowen, "Assessing the Economic Contribution of Education: An Appraisal of Alternative Approaches" in Economic Aspects of Higher Education (Paris: OECD, 1964), pp. 197-99. Although Vimont approaches the problem of forecasting manpower requirements from the standpoint of a bureaucrat and Bowen has an academician's perspective, they are in substantial agreement about the difficulty of making long-term projections. Note also Vimont's evaluation of past French efforts in this area, op. cit., pp. 239-89. For a review of projection techniques see Gottfried Bombach, "Long-Term Requirements for Qualified Manpower in Relation to Economic Growth" in Economic Aspects of Higher Education (Paris: OECD, 1964), pp. 201-222.

Education Variables Subject to the Influence of Economic Conditions

A wide range of variables pertaining to education are subject to the influence of economic conditions, and most readers will immediately think of two or three different ways in which economic circumstances might affect each of the following:

(1) Number of years of formal education.

(2) Subject matter and orientation of formal education.

(3) Distribution of the full-time student population among liberal arts institutions, technical institutions, vocational schools, etc.

(4) Amount of adult, part-time education.

(5) Type of adult education.

(6) Organization of educational administration.

The Effect of Economic Conditions Under Each of Two Unlikely Possibilities

Since the time of Adam Smith, economists have speculated about the existence of limits on rates of economic growth and on the level of wealth that nations can attain. During various periods it seemed evident that a particular obstacle would halt continued economic progress and force the stabilization of incomes at the existing level. Or even if continued growth in the immediate future was a foregone conclusion, certain economists persisted in arguing that long-run tendencies in the existing system of production would either bring repeated crises or slowly drain away the dynamic energies that had stimulated past growth. A detailed recounting of earlier theories is not essential to this discussion, but more recent speculations about the future course of the U.S. economy are relevant. The two extreme viewpoints regarding continued U.S. growth are those of the secular stagnationists on one hand and the proponents of super-abundance through automation on the other. By detailing the likely effects on education of each of these divergent outcomes, the potential significance of economic conditions will become evident, and the economic sensitivity of the above educational variables will become more apparent.

The concept of secular stagnation* has lost favor with American economists during the last decade, and most analysts would probably maintain today that there is no foreseeable limit on U.S. economic growth so long as the government implements appropriate monetary and fiscal policies.

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*In the following discussion stagnation may be interpreted as a tendency for the gap between potential and actual output to progressively widen and for actual output to eventually stabilize at a given constant level. Thus stagnation implies the eventual cessation of growth and not continued growth along an expansion path less than the maximum.

Nevertheless, the popularity of economic theories tends to wax and wane with the immediate outlook, and the prospect of ultimate stagnation constitutes a thread running through Western economic thought for nearly two hundred years. Moreover, these theories provide a useful rationale for establishing one of the limits on the range of economic possibilities.

Probably the most lucid recent review of stagnation theories was compiled in 1955 by Alvin H. Hansen from a number of his earlier works.* He classified arguments that the American economy was tending to stagnate under three different categories:

(1) Arguments that maintain factors external to the economy tend to make expected savings exceed expected investment and, thus, exert a depressing influence on economic activity. Such factors include projected slowdowns in rates of technological innovation or population growth and the closing of territorial frontiers. (Hansen)

(2) Arguments that maintain factors within the economy--such as trade unions and industrial monopolies--interfere with the functioning of free markets and thus prevent the economy from achieving its full potential. (Steindl)

(3) Arguments that maintain fundamental changes in society--such as the spread of state intervention and the acceptance of welfare schemes-- have sapped capitalism of its former dynamic energy. (Schumpeter)

While few present-day economists will accept the element of inevitability contained in these theories, a much larger group would concede the imperfections of the U.S. economic system are such that its full potential will not be achieved without more or less continual government intervention.

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*"The Stagnation Thesis" in American Economic Association, Readings in Fiscal Policy (Chicago: Richard D. Irwin, 1955), pp. 540-57. For earlier discussions of stagnation, see J. Steindl, Maturity and Stagnation in American Capitalism (Oxford: Basil Blackwell, 1952); Benjamin Higgins, "The Concept of Secular Stagnation", American Economic Review, X, (March, 1950), pp. 160-66; Joseph A. Schumpeter, Capitalism, Socialism and Democracy (New York: Torchbook paperback edition, Harper and Row, 1962), Chap. X and pp. 392-98; Karl Marx, Capital (London: William Glaisher, 1920), Vol. II, Chaps. 7-9, 13-21, Vol. III, Pt. 1, Chap. 15, Pt. 2 Chap. 30; Adam Smith, The Wealth of Nations (New York: Modern Library, Random House, 1937), p. 71.

Another smaller group, whose leading spokesman is Robert Theobald,* would agree that the full potential of the U.S. economy will not be reached without government intervention, but would offer a very different interpretation of the technological outlook. Theobald and his adherents would maintain that the rapid introduction of automation throughout American industry is about to result in a spectacular jump in labor productivity. Consequently, a fraction of the current labor force will be able to produce the current volume of output, and large numbers of persons will be threatened with unemployment. In contrast to the stagnation theories outlined above, Theobald's deflationary gap results from a discrepancy between ability to consume and ability to produce rather than from an excess of expected savings over expected investment. His solution to this impending problem is to introduce a guaranteed annual income as the constitutional right of each individual and to gradually raise the level of this guaranteed income. The total ability of the nation to consume would then remain in line with our aggregate productive capability. Thus, he envisions that in the not too distant future Americans will enjoy both unprecedented amounts of leisure time and unprecedented levels of material abundance.**

Office of Education planners are therefore confronted with two widely divergent interpretations of the long-run future of the U.S. economy, both of which are subject to shifts in academic and intellectual fashion and neither of which can be totally discounted. The problem, however, may not be so serious as the dispersion between these two projections might initially suggest, since some educational variables may be relatively insensitive to fluctuations in economic conditions.

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*The Challenge of Abundance (New York: Clarkson N. Potter, 1961); The Guaranteed Income (Garden City: Doubleday, 1966). See also the Ad Hoc Committee for the Triple Revolution, "The Triple Revolution", Liberation, (April, 1964), pp. 9-15.

**As one might expect, there is little in Theobald's argument that was not foreshadowed by earlier writers. Technological unemployment has been the bogey of trade unionists for decades, and the ultimate achievement of material abundance was envisioned by both J. M. Keynes in "Economic Possibilities for our Grandchildren," Essays in Persuasion (New York: W. W. Norton, 1963), pp. 358-74, and by Marxists-Leninists in the final realization of communism. Of course, Theobald may be correct in maintaining that the time for these long foreseen events will shortly arrive.

If one of the various stagnation theses were to prove valid, what impact would the cessation (or near cessation) of economic growth have on the American education system? First, a very slow or zero economic growth rate need not imply that the skills and qualifications of the labor force would also cease to improve. Depending upon the operational factors producing stagnation, continued increments in labor force capabilities might be necessary to prevent an actual decline in aggregate production. Moreover with economic growth eliminated as the means through which all individuals could improve their material condition, only relative gains would be possible, and education might become an even more critical factor in upward mobility. On the other hand, if per capita incomes were not to decline absolutely, population growth would also have to halt. Hence, total demand for teachers and educational facilities might drop somewhat. The net impact of economic stagnation on aggregate demand for education, therefore, is ambiguous.

In the event of stagnation, both course content and the distribution of the student population would probably shift towards mathematics, the sciences, engineering and other technical fields in an effort to derive the greatest possible benefits from given resource inputs and to develop innovations for renewed growth. Changes in the amount and type of adult education might also reflect the forces tending to expand the duration and technical content of formal preliminary training. But if the rate of technological advance were not at least maintained, demand for adult education, which is in many cases re-education, might well decline.

A tendency for the economic growth rate to approach zero would probably be regarded as a major challenge to American inventiveness and as a threat to the maintenance of the international economic and military primacy of the United States. Faced with such a threat, our response (as during the depression of the 1930s, World War II, and the post-Sputnik scare) would probably be to mount a centrally directed campaign against the apparent sources of the malaise. Consequently educational administration might well tend to become more centrally directed.

Turning to the other set of possibilities at the opposite end of the continuum, the achievement of material abundance accompanied by unprecedented amounts of leisure would, as with the case of stagnation, produce conflicting results. Extensive formal education would be less of an economic necessity, but might become more valuable as a means to personal satisfaction. Subject matter and student interest would probably shift somewhat away from technical and utilitarian fields and towards literature and the arts. Thus, the number of years of formal education would probably tend to stabilize or perhaps even decline. But because economic constraints would not be an important factor limiting population growth, because more people could afford schooling, and because of increased leisure and reduced pressure to "get out and make a living," total demand for formal preliminary education might continue to increase at a reduced rate.

The content of adult education would probably follow the same general trends, but total hours of adult education would most likely increase significantly and stabilize at a higher level. Even though some students might desire to curtail their years of formal preliminary education, they would probably be more interested than previously in continuing to acquire additional education throughout the remainder of their lives as a means of making life more interesting and fulfilling.

The achievement of economic abundance would probably foster a relaxed attitude towards experimentation in educational methods and content. The likely result would be considerable diversity among local educational systems or schools and a decline in the influence of both federal and state educational officials.

To summarize briefly these speculations about the impact on education of diverse economic possibilities, whatever the rate of economic growth during the remainder of this century, the increasing trends in the number of years of formal preliminary education and in the annual hours of adult education are likely to persist. Of course, the rates of increase and the reasons for the gains would differ according to circumstances, but the likelihood of a reversal in these long-standing tendencies is small. On the other hand, the distribution of student-hours between humanities or liberal arts courses and technical subjects, as well as the degree of central control over course content and degree requirements, could differ substantially according to the path of economic events. Comparatively slow growth rates and modest gains in personal incomes would be likely to result in relatively greater emphasis on technical subjects and in more detailed and extensive central supervision than would rapid growth and widespread affluence.

An Attempt to Project the Actual Course of Developments

A review of economic prospects for the United States during the remainder of this century suggests that neither the stagnationists' nor Theobald's outline of the future is likely to be borne out. Instead the picture is one of continued economic progress supported by further technological advancement, but the projected level of affluence as of the year 2000 falls considerably short of super-abundance. While American society will perhaps be on the verge of Daniel Bell's "post-industrial era," we will still remain several decades or even a century from the post-economic age.

These conclusions are based on projections of past trends in U.S. labor productivity and technological innovation. Of course, no extension of past trends--even if some of them appear to be extremely stable over long periods--can rule out the possibility of revolutionary transformations. Projections can only show that to date there is no apparent indication of revolutionary change. However, an order of magnitude shift either upward or downward in the year 2000 outcome of these projections would not alter the foregoing conclusions; only an unexpected set of contingencies acting in concert could produce a significantly different outcome.

One way of gauging the increasing affluence of American workers is to compare the prices of basic commodities like food, clothing, housing and medical care with the average hourly wages of manufacturing employees. Such a comparison over time may be expressed as a series of index numbers and may be thought of as reflecting the change in working time required to buy a given bundle of a particular kind of goods (i.e., food or clothing, etc.). If the working time required to purchase the bundle decreases, then the consequent rise in real income can be taken in the form of additional leisure, an improvement in the quality of the items included in the bundle, or increased expenditures on other kinds of goods.

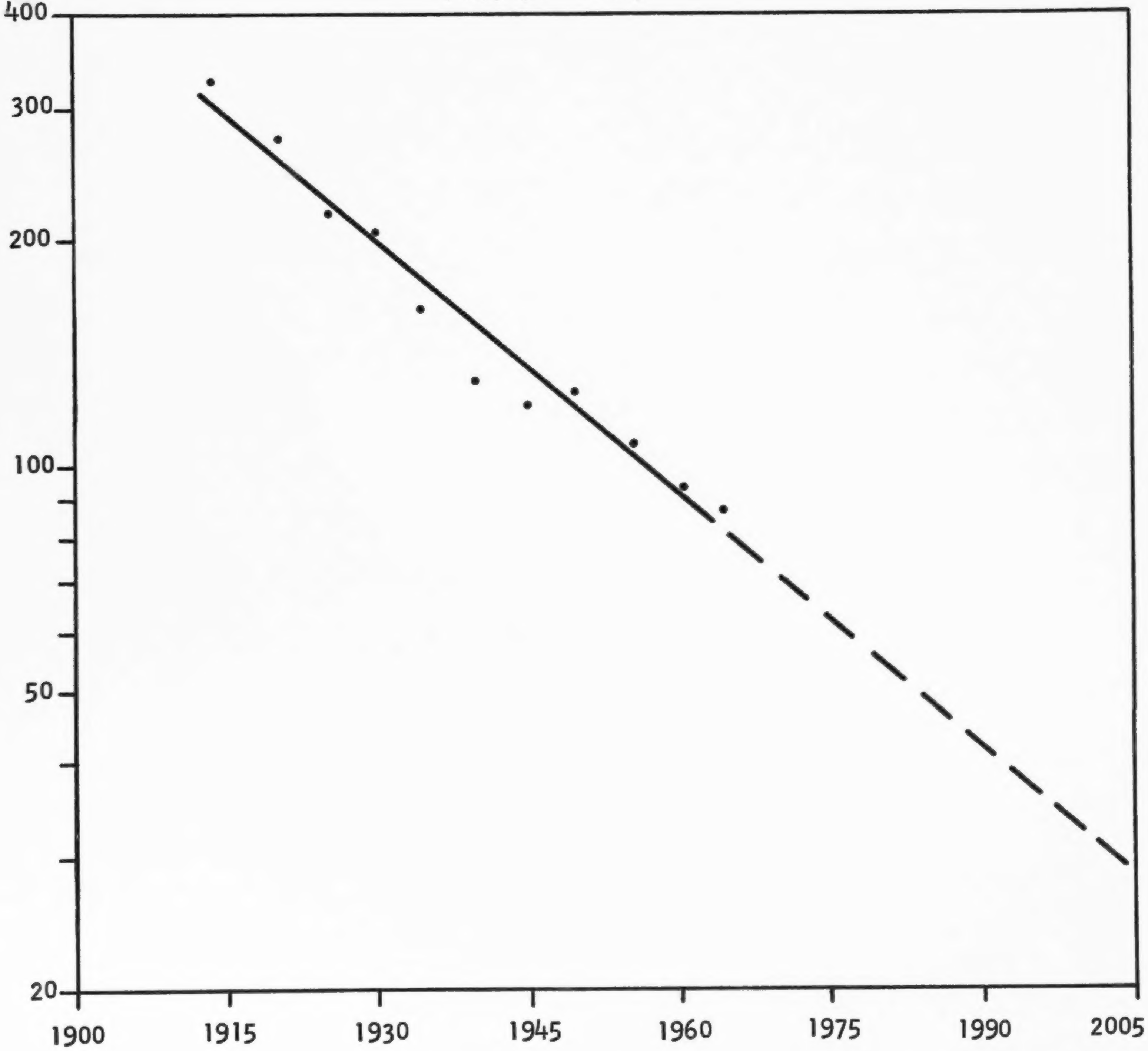
In actual practice such income gains are distributed among all three of these possibilities. While the decline in the average work week and the increase in spending for education, entertainment and travel are comparatively easy to identify, it is virtually impossible to adjust price indexes accurately for improvements in the quality of goods and services. Typically adjustments for quality changes lag behind events or do not fully reflect the gains that have been incorporated gradually over a period of years. Thus, a comparison of price indexes with average hourly earnings in manufacturing would tend to underestimate somewhat the actual increase in the affluence of these workers.

Although manufacturing production workers constitute less than 15 per cent of the total employed labor force, this group can be usefully used as a standard for historical comparisons. Data on their hourly wages are available back to the early 1900s, and throughout the twentieth century manufacturers have had to compete with the service industries or agriculture for employees.

Figures 1 through 4 indicate that since 1915 or 1920 the real cost to manufacturing workers of food, clothing, housing and electric service have fallen to at least one-third of their former levels and that another approximately equivalent decline is likely to occur by the end of this century. The cost of medical care (Figure 5), on the other hand, has remained approximately constant in relation to manufacturing wages since the early 1950s. This cost index probably has not been deflated sufficiently to take full account of the improvements in medical care that

Figure 1

INDEX OF FOOD PRICES RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING (1957-59 = 100)

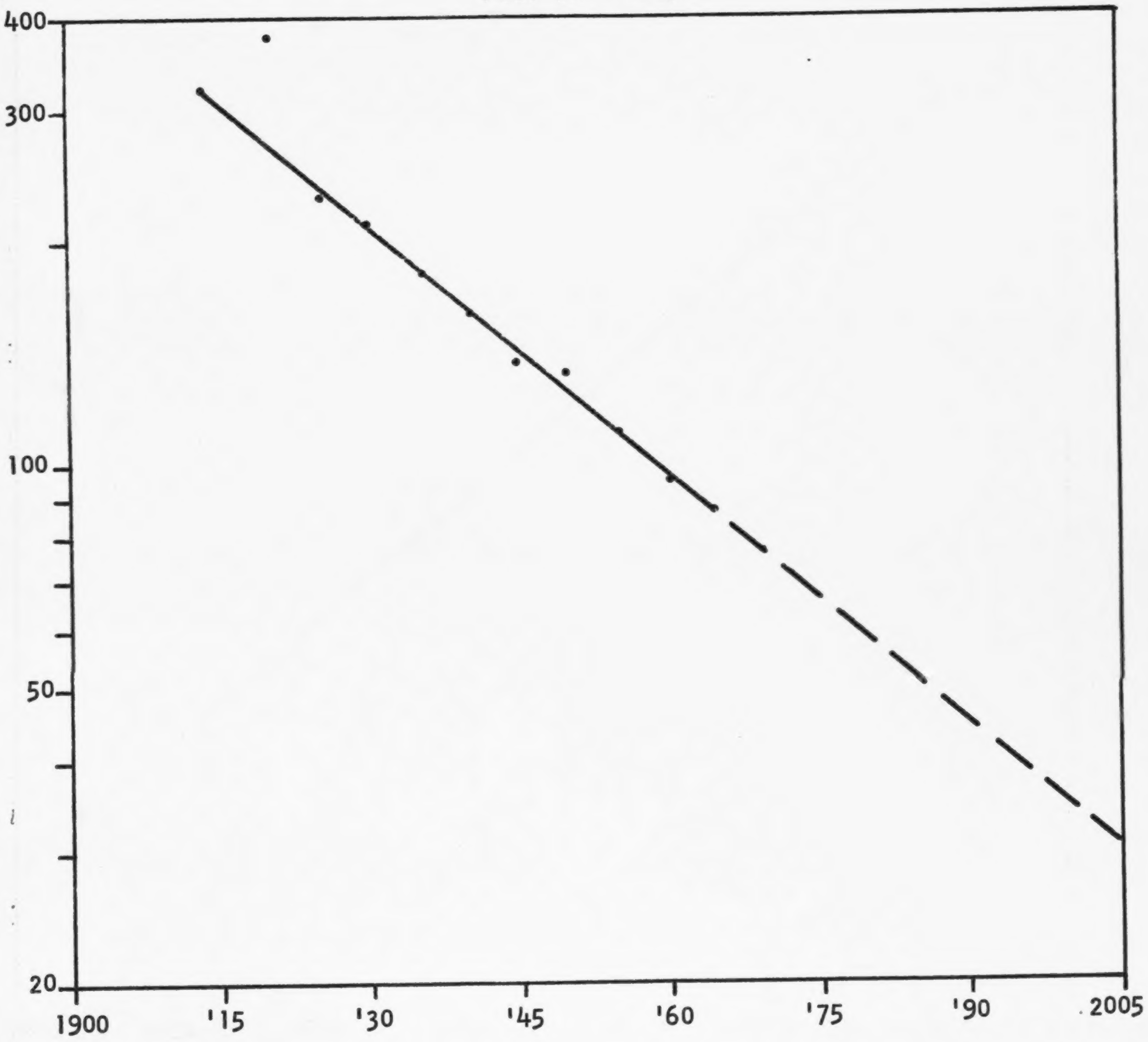


NOTE: The above index is the quotient of the consumer price index for foods compiled by the Bureau of Labor Statistics, having 1957 through 1959 as its base years, divided by an index of the average hourly earnings of manufacturing production workers constructed to have the same base years.

Sources: U.S. Bureau of the Census, Statistical History of the United States (Stamford: Fairfield Publishers, Inc., 1966), Series E 115a, D 626; Bureau of Labor Statistics, Monthly Labor Review, August 1967, Table D 1, p. 117; Bureau of Labor Statistics, Employment and Earnings, January 1967, Table C 1, p. 59.
(Statistical History of the United States and Monthly Labor Review shall hereafter be referred to respectively as History and MLR.)

Figure 2

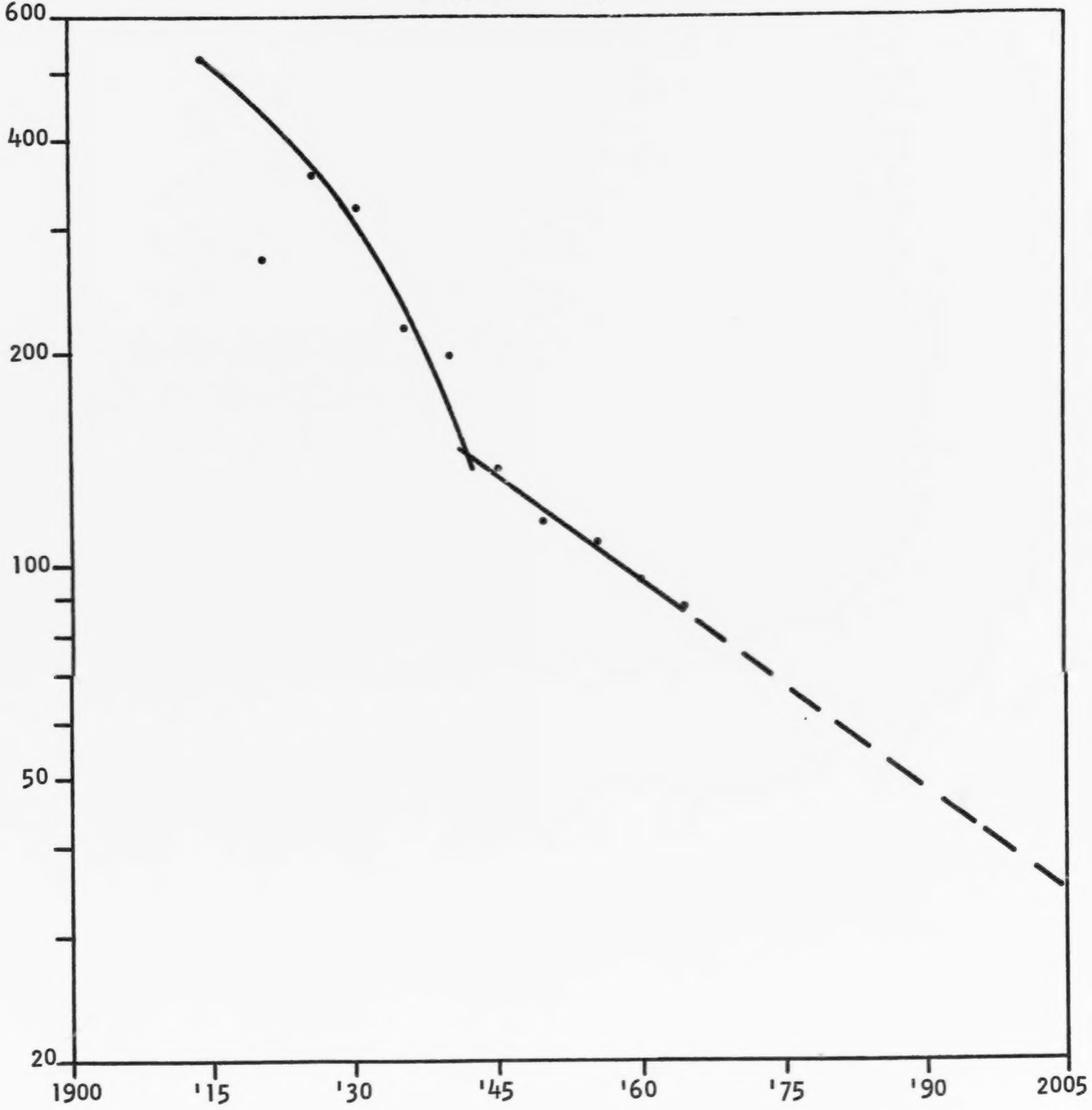
INDEX OF COST OF CLOTHING RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING (1957-59 = 100)



Sources: History, Series E 128a; MLR, August 1967, Table D 1, p. 117.

Figure 3

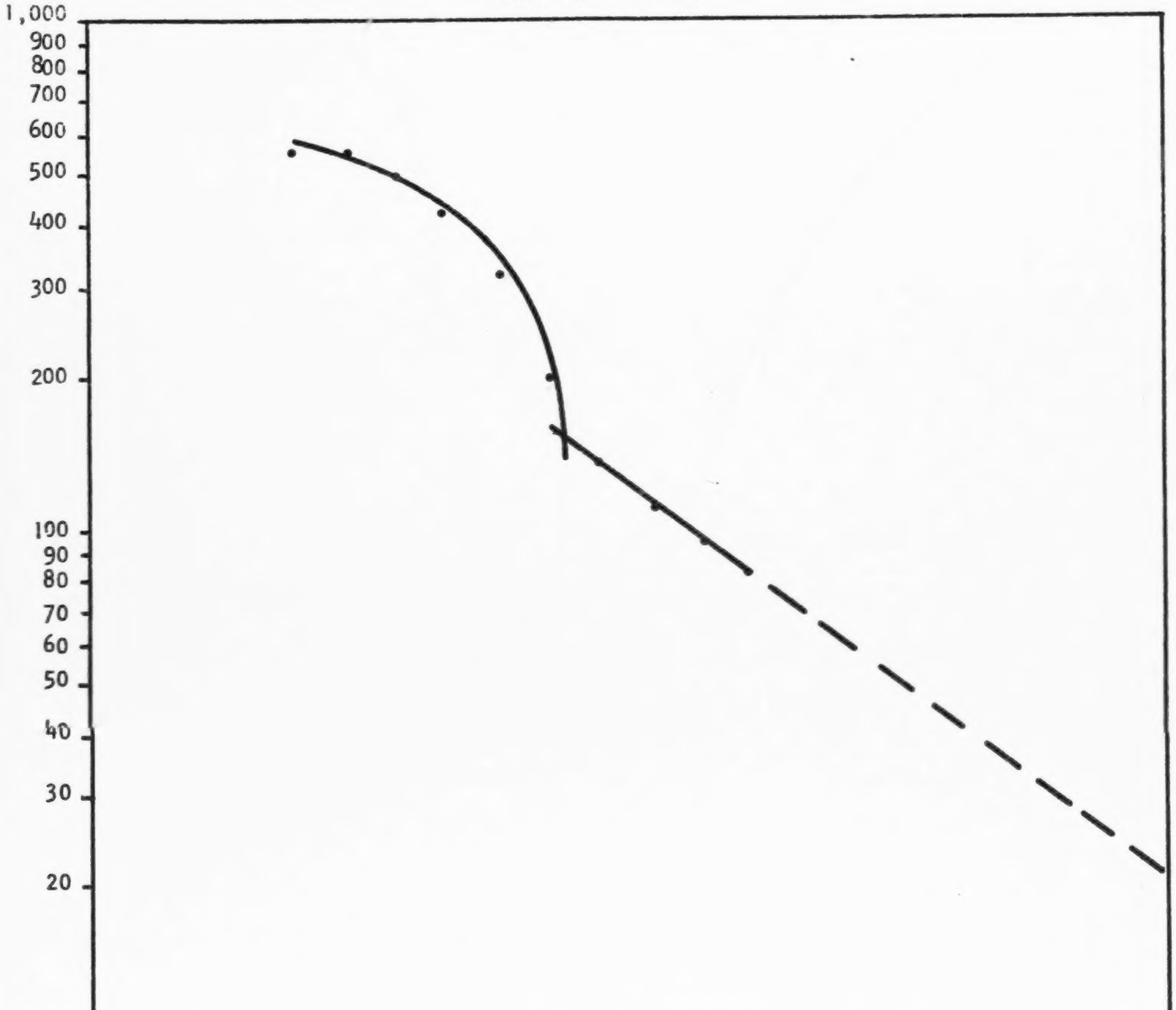
INDEX OF RENTAL VALUE OF HOUSING RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING (1957-59 = 100)



Sources: History, Series E 122a; MLR, August 1967, Table D 1, p. 117.

Figure 4

INDEX OF COST OF ELECTRICITY TO CONSUMERS RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING (1957-59 = 100)

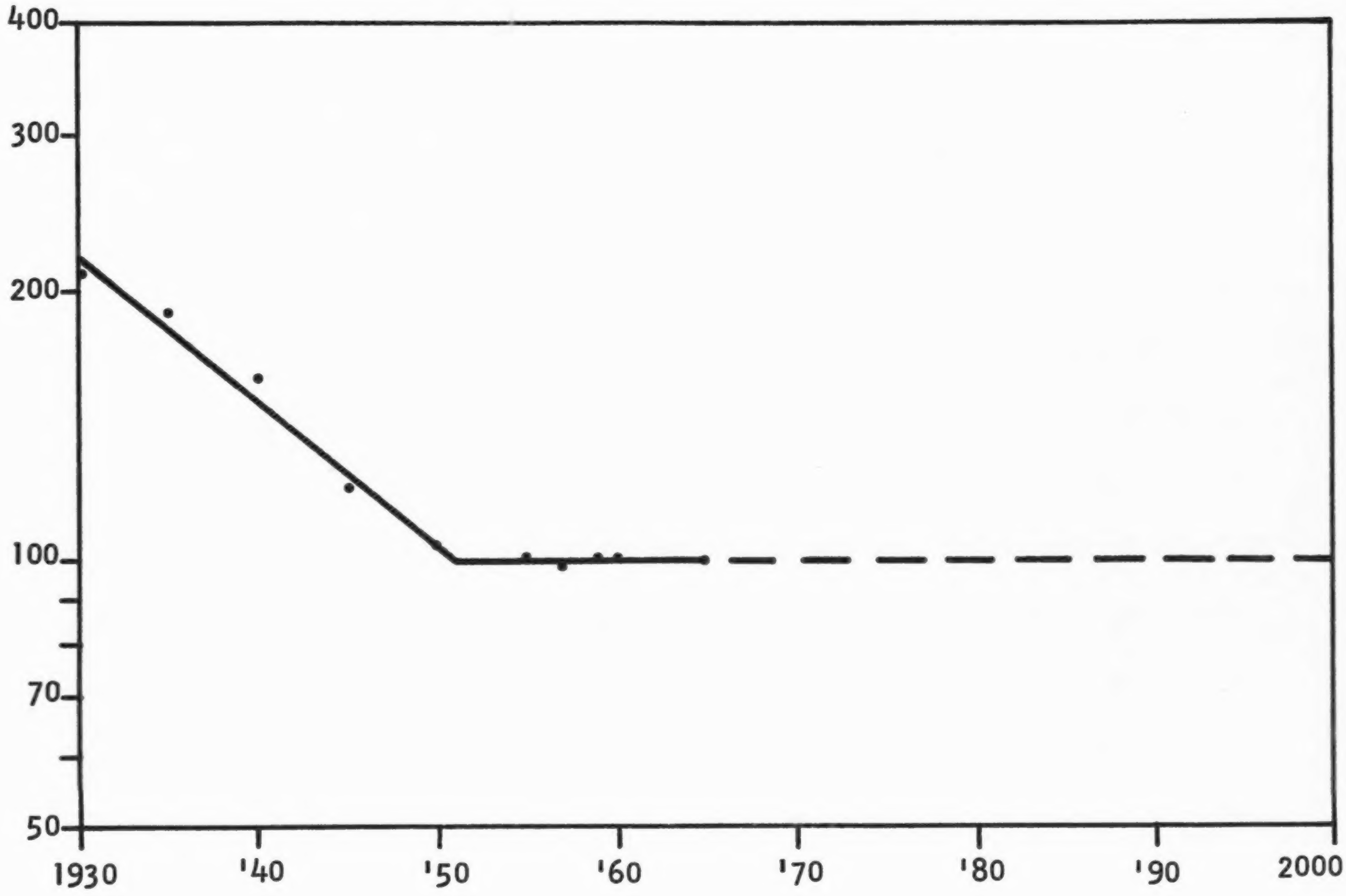


Sources: History, Series E 177a; U.S. Bureau of the Census, Statistical Abstract of the United States: 1966 (87th Ed.)(Washington, D.C., 1966), Table 509, p. 363.

(Statistical Abstract of the United States shall hereafter be referred to as Abstract.)

Figure 5

INDEX OF COST OF MEDICAL CARE RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING
(1957-59 = 100)



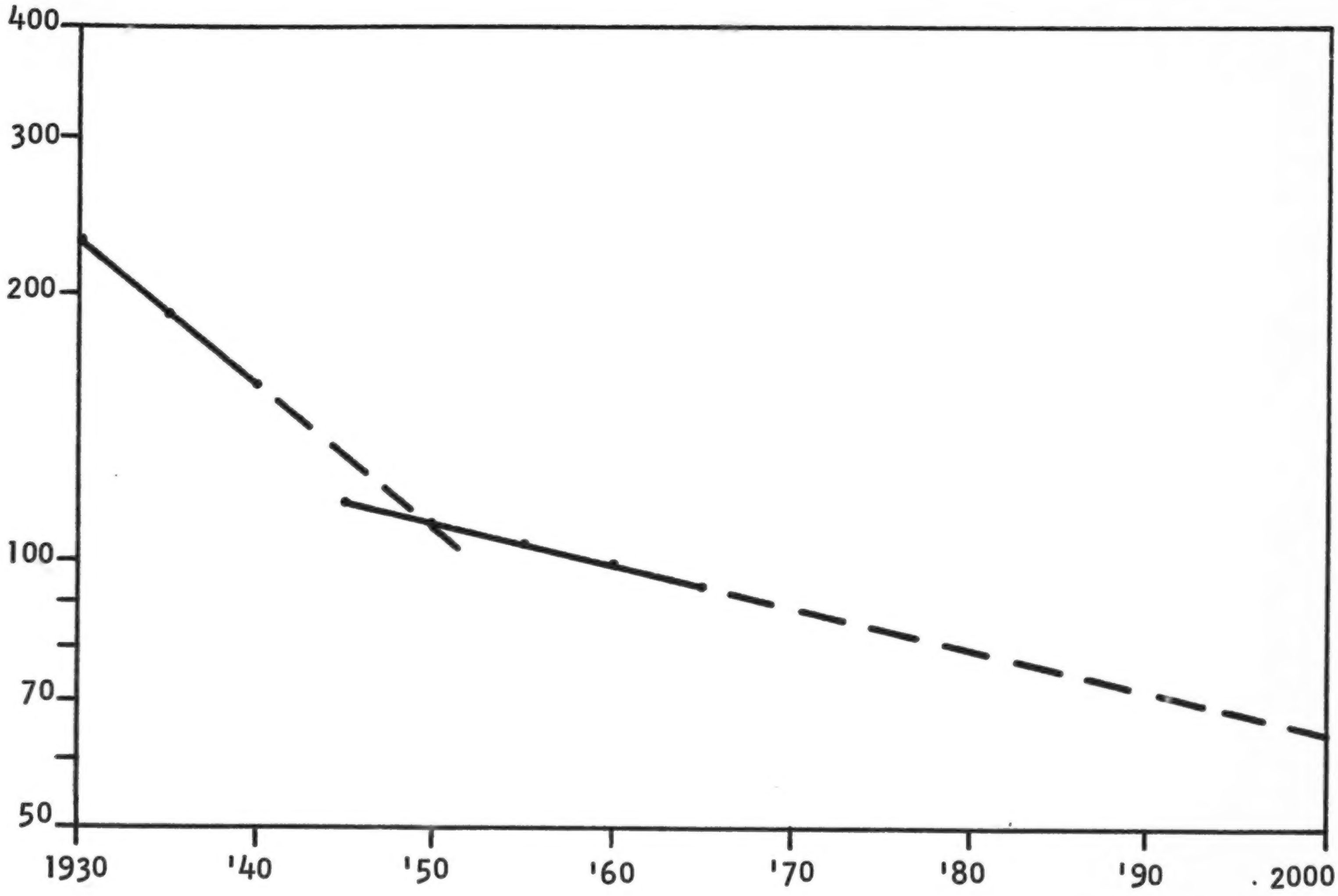
Source: History, Series E 136a.

have occurred in recent years; nevertheless, any declines in relative medical costs that occur during the next thirty-odd years will probably be minor. Figures 6 and 7 indicate that the relative cost of transportation is also likely to remain relatively stable. While the expense of user-operated transportation has declined relative to manufacturing wages in the past and will probably continue to do so in coming years, the cost of purchased local transportation (including commuter services) appears to be on a rising trend.

These rather dramatic decreases in the real costs of many important consumer goods reflect technological advancement and increasing productivity on two fronts. First, through rising levels of education and assistance from more sophisticated machines, manufacturing workers have been able to increase their output per man-hour and, consequently, their hourly earnings. Second, the same type of process has occurred in each of the major industries--food, clothing, etc.--producing basic consumption goods. Mechanization and increasingly skilled manpower have helped prevent even greater increases in actual commodity prices. But despite these dramatic declines in prices relative to manufacturing wages, the average work week and the expenditure patterns of all consumers have changed only gradually over time. The work week has been shortened only marginally since the end of World War II (see Figure 8), and virtually all projections indicate that it will not be much below 30 hours, if even that short, by the end of this century. As a proportion of total consumer expenditures, total outlays for food, clothing, housing, utilities, and medical care have dropped from 66 per cent in 1909 and 62 per cent in 1930 to 57 per cent in 1965 (Table I). At this rate of decrease the same set of commodities

Figure 6

INDEX OF COST OF USER-OPERATED TRANSPORTATION RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING
(1958 = 100)

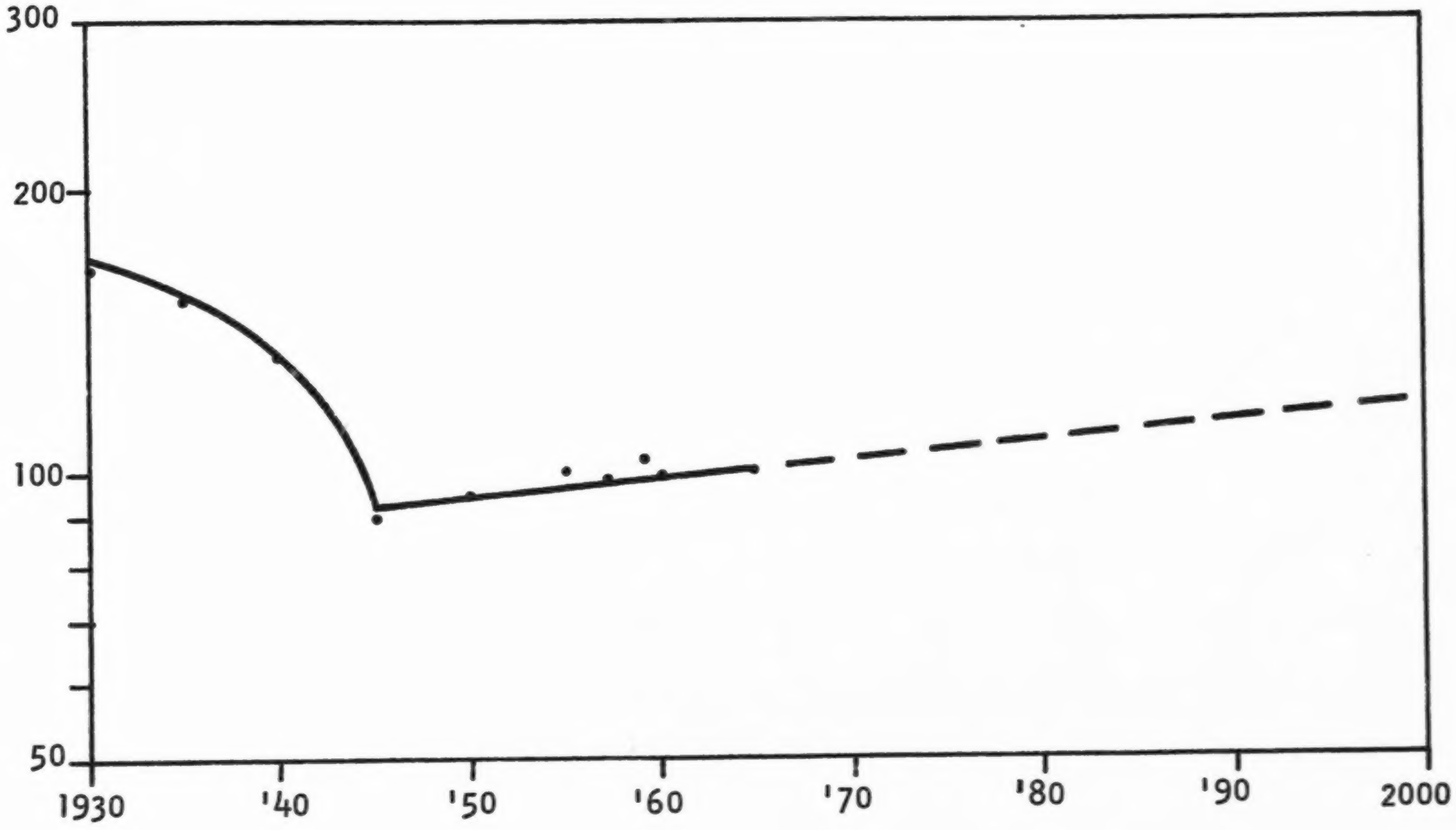


Source: Office of Business Economics, The National Income and Product Accounts of the United States, 1929-65 (A Supplement to the Survey of Current Business), Table 8.6, p. 162, line 46.

(The National Income and Product Accounts of the United States shall hereafter be referred to as National Income.)

Figure 7

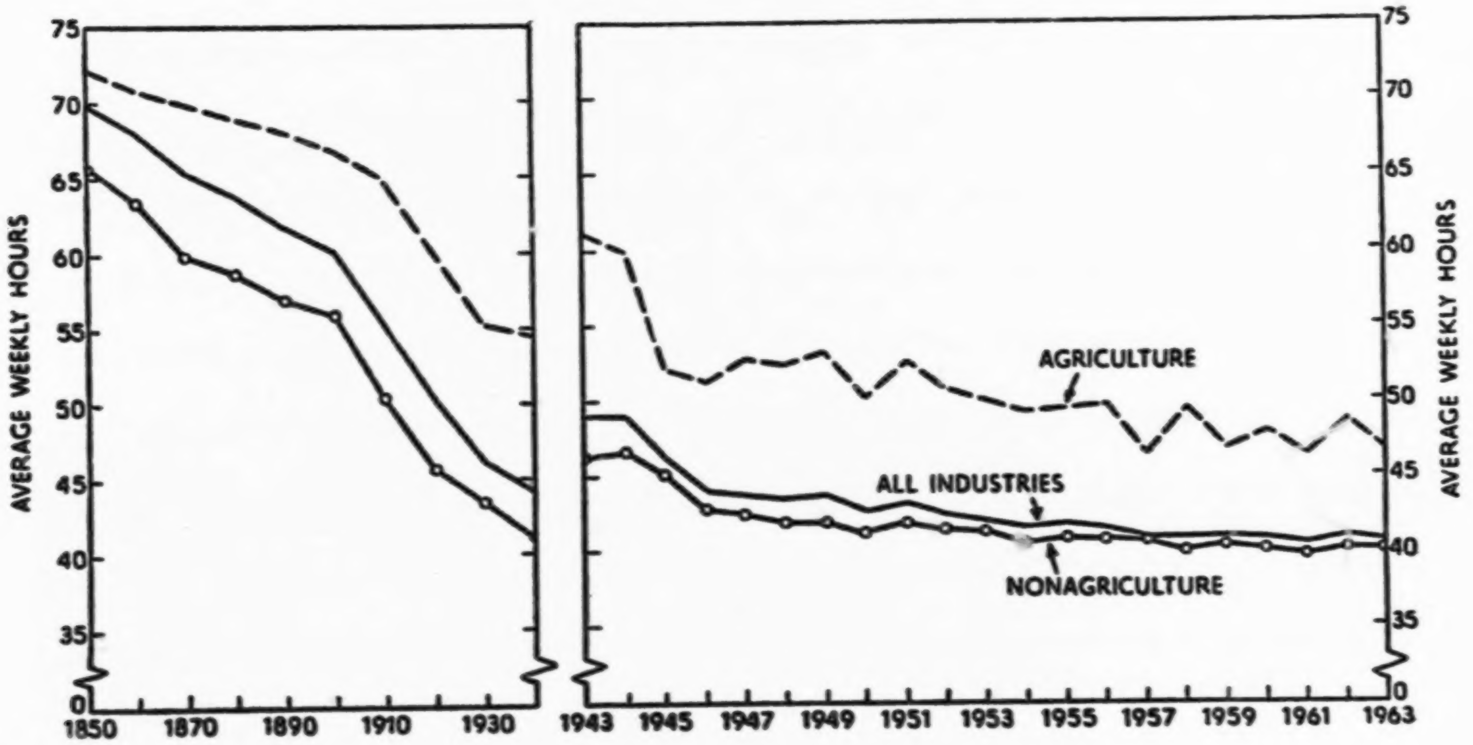
INDEX OF COST OF PURCHASED LOCAL TRANSPORTATION RELATIVE TO AVERAGE HOURLY EARNINGS IN MANUFACTURING
(1958 = 100)



Source: National Income, Table 8.6, p. 163, line 47.

Figure 8

THE DECLINING WORK WEEK



SOURCE: U.S. Bureau of Labor Statistics. Chart courtesy of Richard D Irwin, Inc.

TABLE I

Consumer Expenditure Patterns

Percentage of Total Expenditures on:	1909	1930	1965	2000
Food	26	25	20	~15
Clothing	13	12	10	~ 8
Housing	19	15	15	~15
Utilities	5	5	6	~ 5
Medical Care	3	5	6	~ 8
TOTAL	66	62	57	~50

Sources: History, Series G 219-243, G 191-218; Abstract, Table 457, p. 324.

may account for about one-half of consumer expenditures as of the year 2000. Of course, the fact that the rate of decline has not been faster reflects the inclusion of many new or improved commodities, like telephone service, in this grouping.

Another way of measuring the productive capacity and hence the affluence of a nation is to trace the cost of essential services utilized by both individuals and industry--such as transportation, electric power, and communications--in monetary units having a constant value. Of course, any such attempt requires the selection of a price index for deflating current prices. The choice of an index to deflate the prices of services that are utilized by both individuals and industry is a difficult decision, and no selection is likely to be ideal for this purpose. What seems essential, however, is an index that includes a broad range of prices for both consumers' and producers' goods. Consequently, the GNP price deflator compiled by the Commerce Department is used in the following analysis.* To the extent that the deflated price of any given service tends to decline, this drop in part reflects a faster rise in the total productivity of the industry producing that service than in the remainder of the economy.

Looking first at transportation, Figure 9 suggests that there may be little, if any, decline in railroad fares per passenger-mile during the remainder of this century. On the other hand, air fares per passenger-mile can be expected to decline substantially, perhaps at an even faster rate than indicated in Figure 10. Among freight carriers, ton-mile trucking rates will probably continue to fall slowly relative to other prices,

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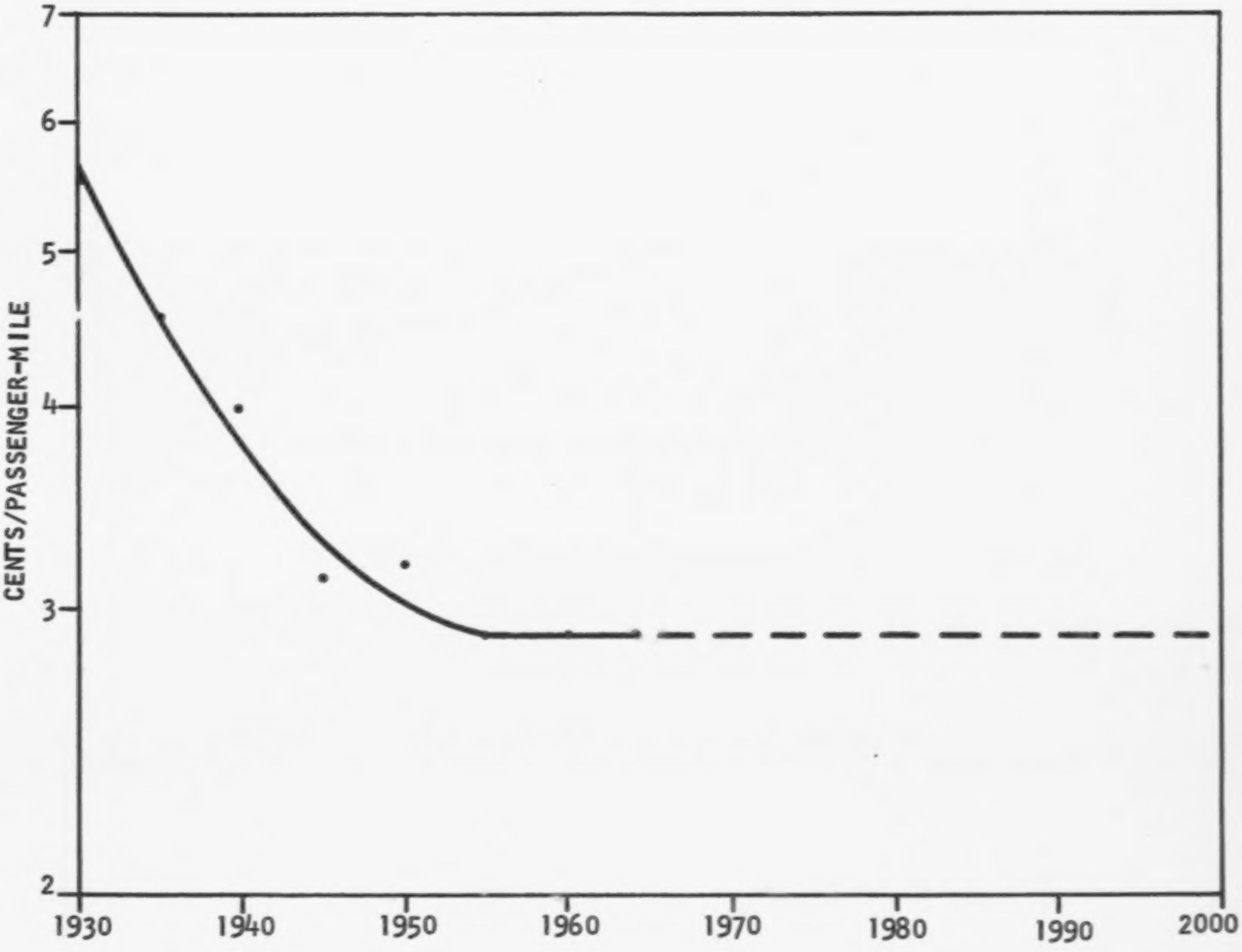
*Office of Business Economics, The National Income and Product Accounts of the United States, 1929-65 (A Supplement to the Survey of Current Business), Table 8.1, pp. 158-9.

Figure 9

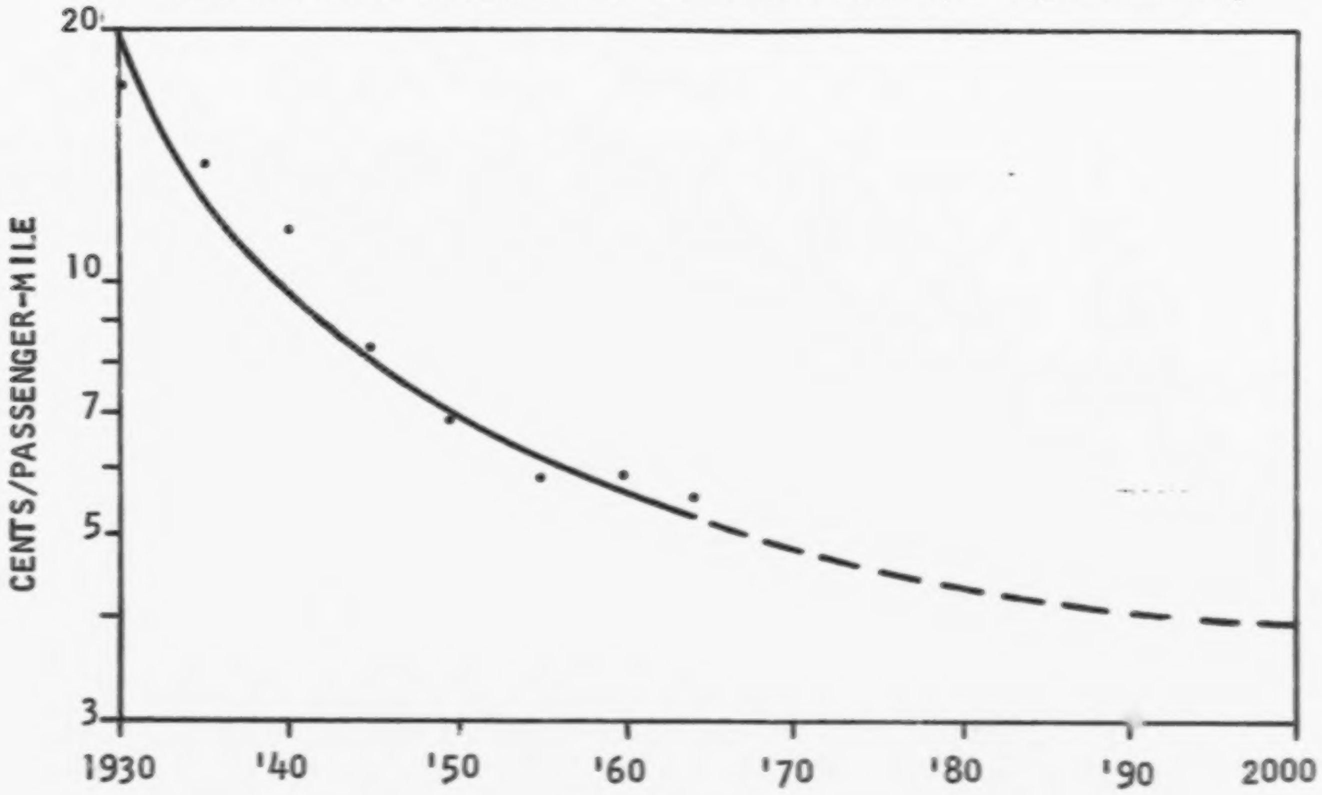
RAILROAD REVENUE PER PASSENGER-MILE
(IN 1958 DOLLARS)



Sources: History, Series Q72; Abstract, Table 6[illegible].

Figure 10

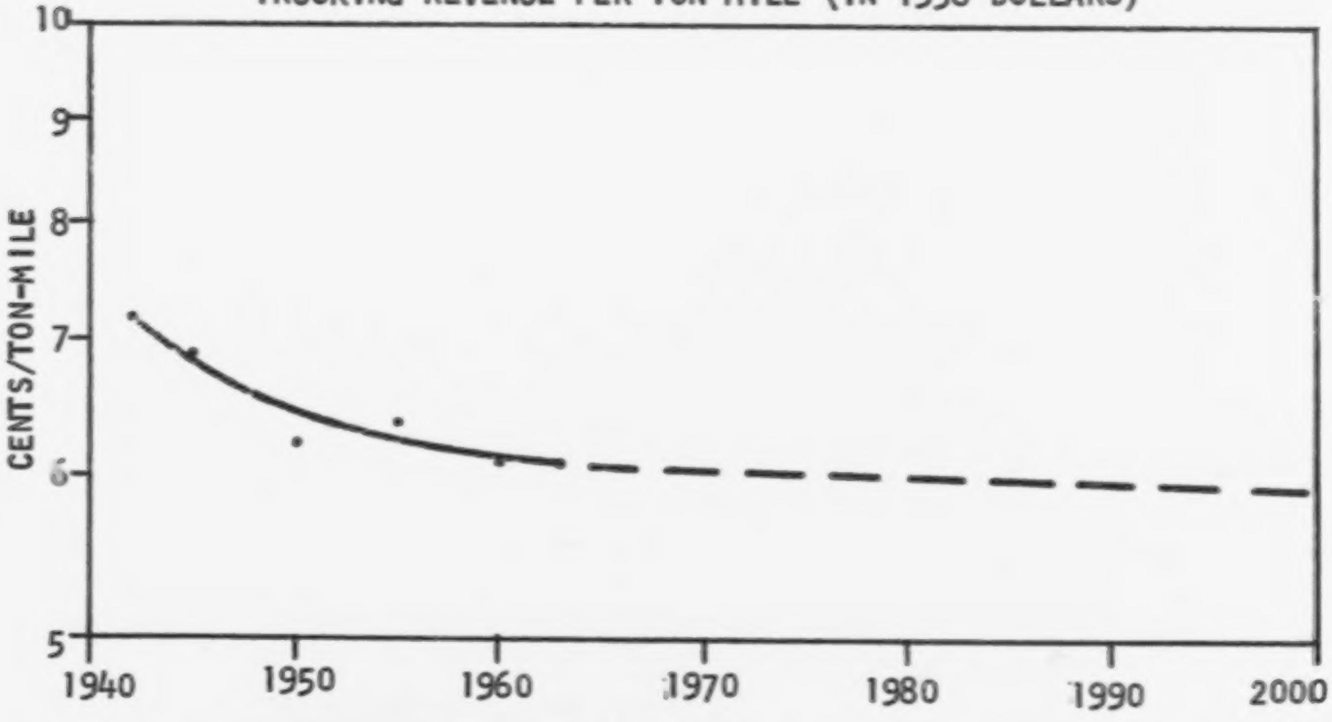
DOMESTIC AIR REVENUE PER PASSENGER-MILE (IN 1958 DOLLARS)



Sources: History, Series Q 355; Abstract, Table 857, p. 593.

Figure 11

TRUCKING REVENUE PER TON-MILE (IN 1958 DOLLARS)



Source: Interstate Commerce Commission, Transport Economics, July 1964, p. 1.

as these rates have over the past two decades (Figure 11). But as of the year 2000 rail freight rates per ton-mile may well be only about one-half of the current level (Figure 12). Oil pipeline charges per ton-mile (Figure 13) appear to be dropping at a slower rate, but the absolute difference between them and higher rail rates will probably be sufficient to allow pipeline operators to maintain the pace of their recent advances in capturing a larger share of the bulk freight market. As the fastest growing carriers, however, ton-mile rates charged by air freight companies may by the end of the century be no more than one-half of the current levels (Figure 14). Similarly, the cost of electricity to large users (Figure 15) and communications rates (Figures 16 and 17) will probably drop about 50 per cent by the year 2000.

The foregoing projections tend to support others based on much longer term trends* indicating that at the end of this century Americans will almost certainly be two or three times as wealthy as they are today but probably not five, six, or seven times as affluent. Perhaps the most concrete way to describe this prospect is to say that the average American family will be able to enjoy a current standard of living with only about 50 per cent or one-third of the effort required today. Of course, most families will desire to improve the conditions of their daily lives in addition to having more leisure time, and thus standards of living will actually rise. To summarize the preceding data in a bit more detail:

(1) The real cost to consumers of food, housing, clothing, and electricity will each fall to about one-third of their present level by the end of this century. Real communications costs will decline by at least 50 per cent. The major exception to this pattern is the cost of medical care, which

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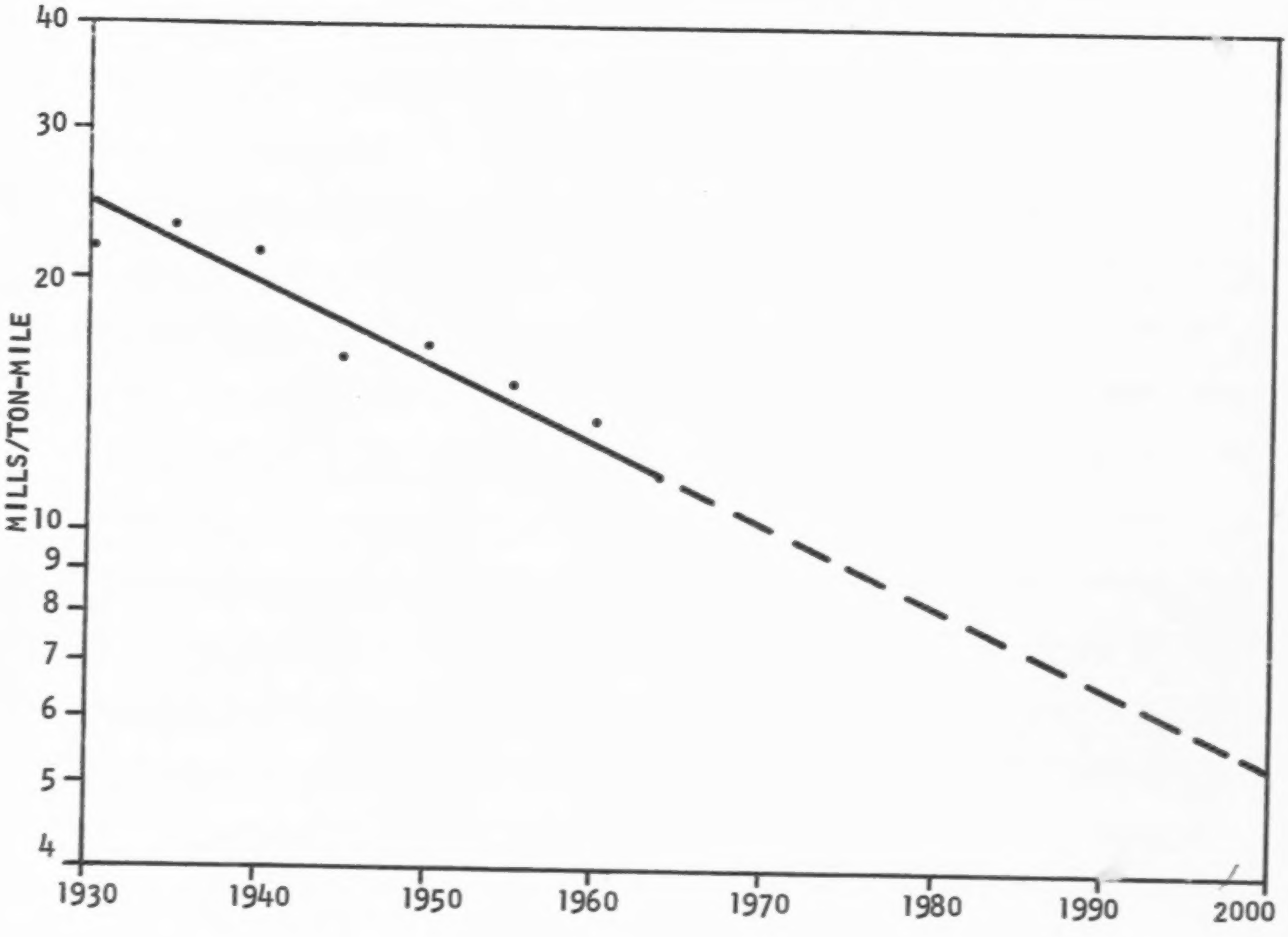
*Herman Kahn and Anthony J. Wiener, The Year 2000: A Framework for Speculation on the Next Thirty-Three Years (New York: The Macmillan Company, 1967), pp. 119-123.

Figure 12

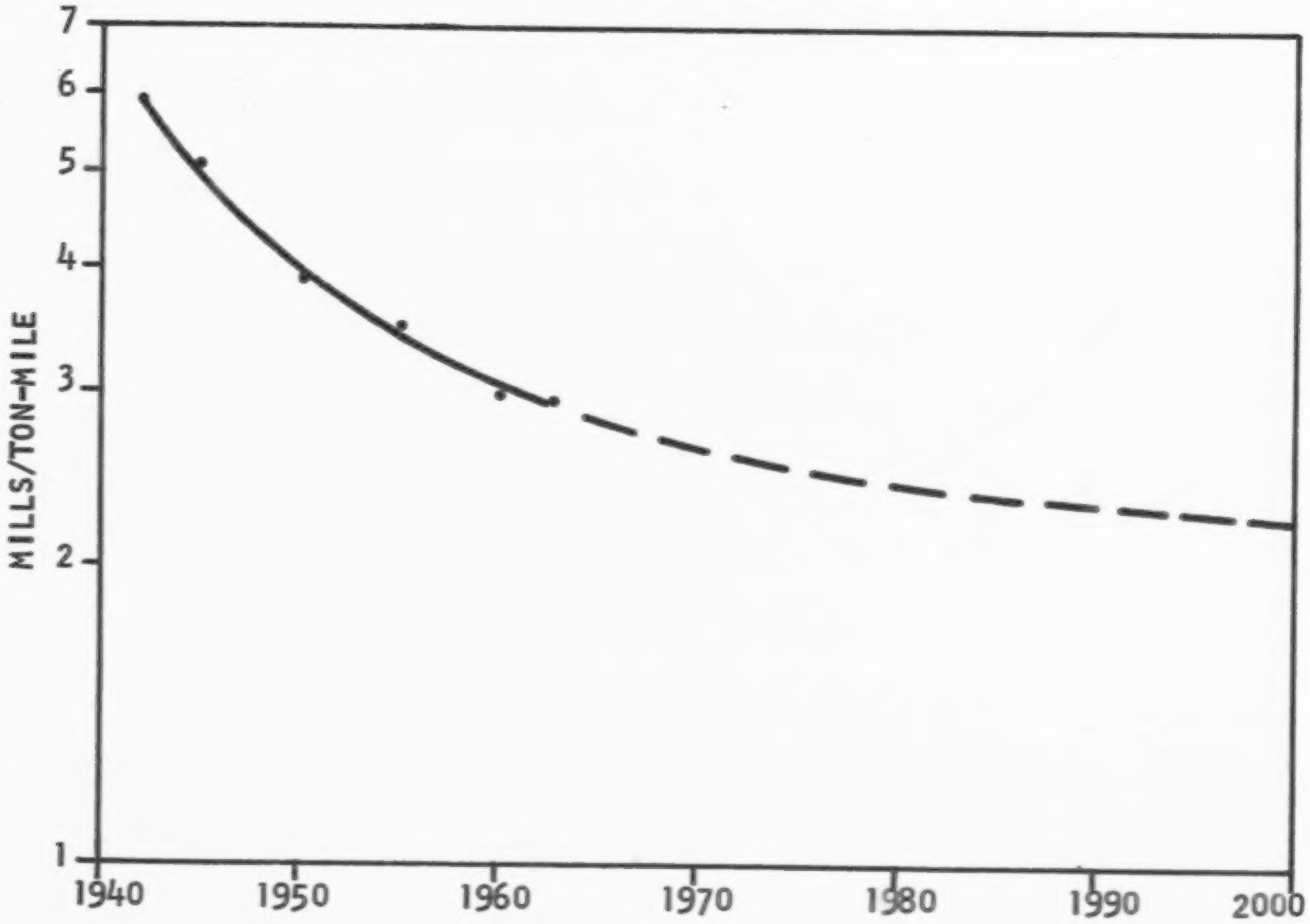
RAILROAD FREIGHT REVENUE PER TON-MILE
(IN 1958 DOLLARS)



Sources: History, Series Q 86; Abstract, Table 839, p. 582.

Figure 13

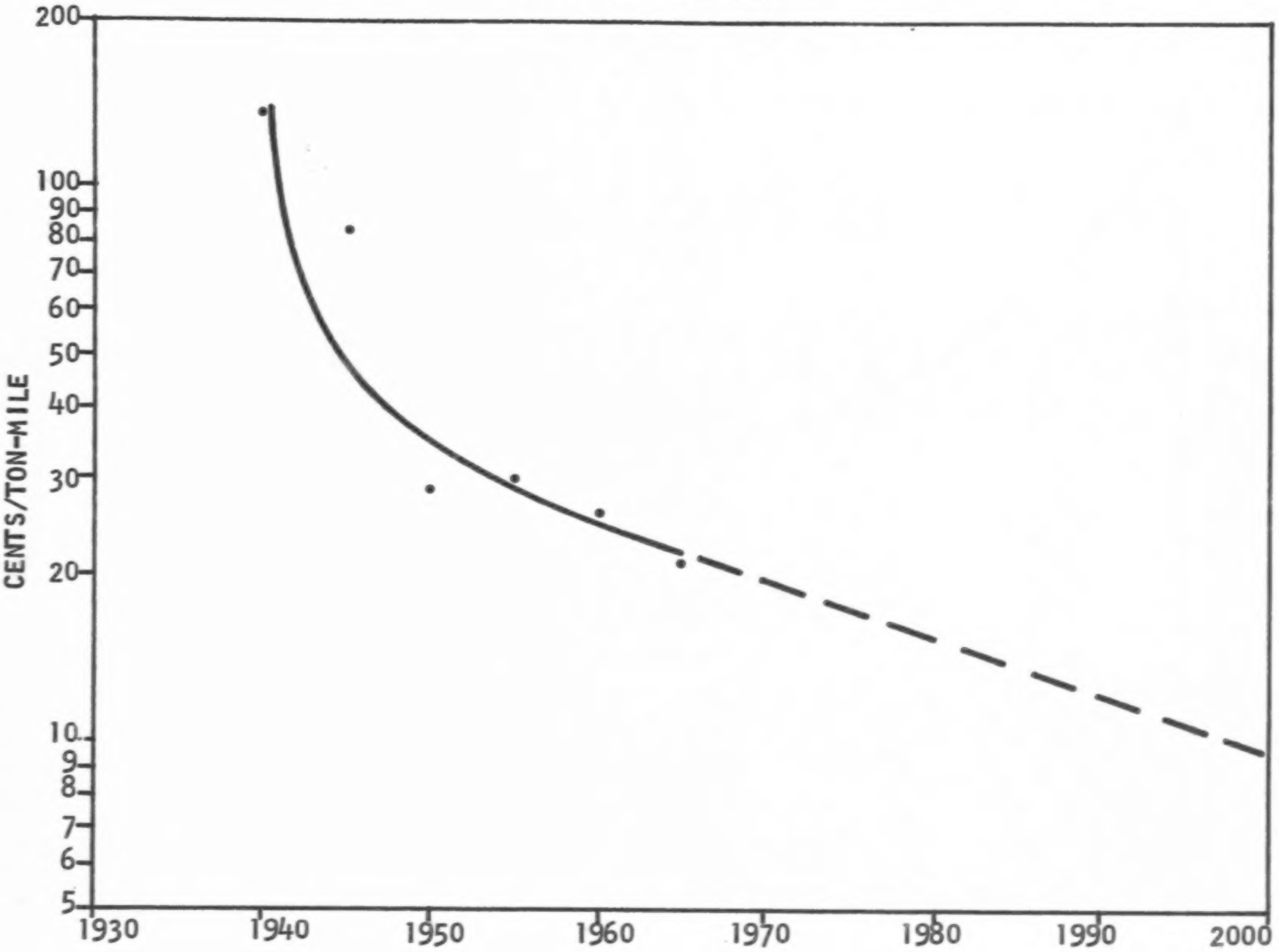
OIL PIPELINE REVENUE PER TON-MILE
(IN 1958 DOLLARS)



Source: U.S. Interstate Commerce Commission, Transport Economics, July 1964, p. 1.

Figure 14

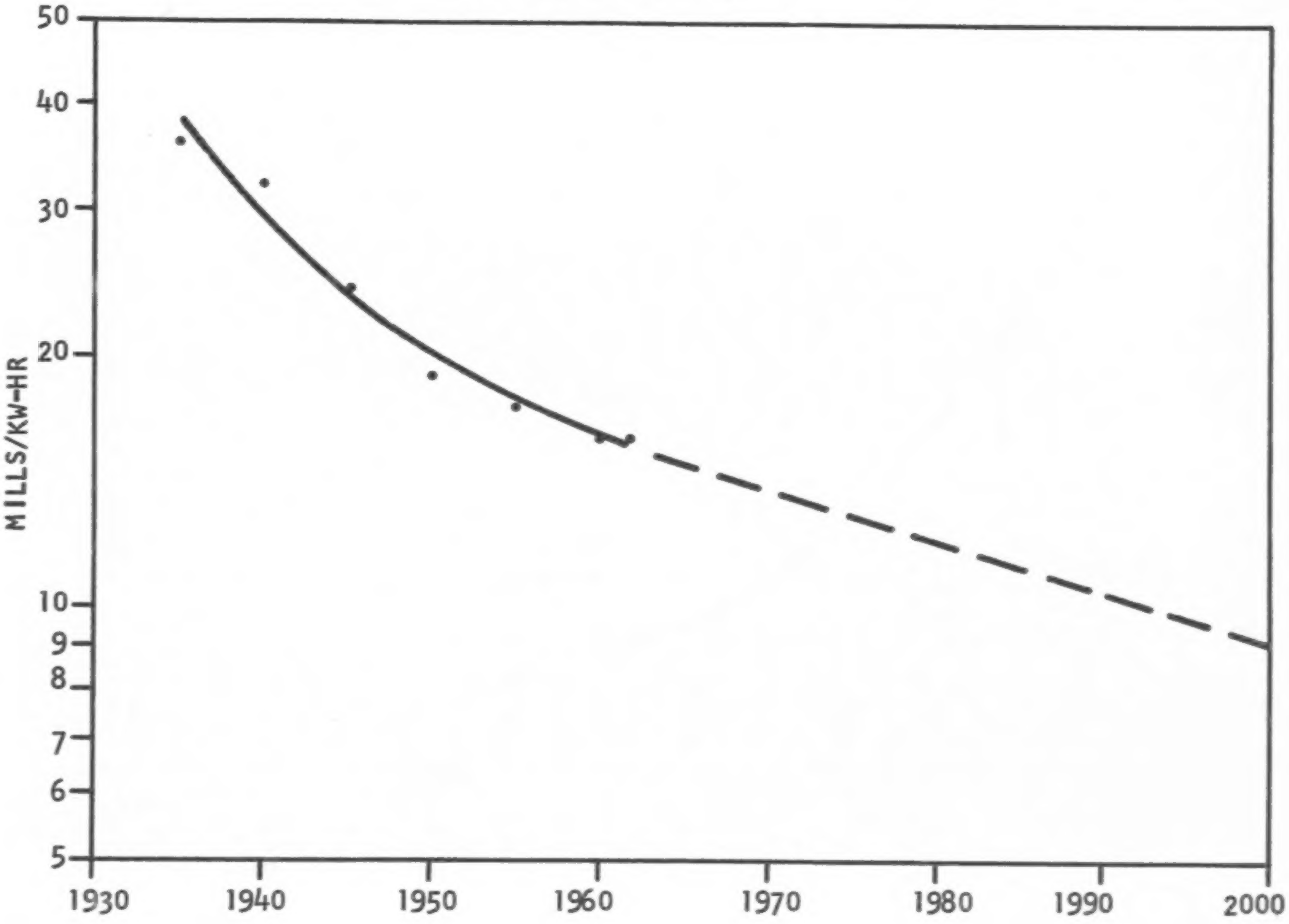
DOMESTIC AIR FREIGHT REVENUE PER TON-MILE
(IN 1958 DOLLARS)



Sources: History, Series Q 361, Q 366; Abstract, Tables 857, 859.

Figure 15

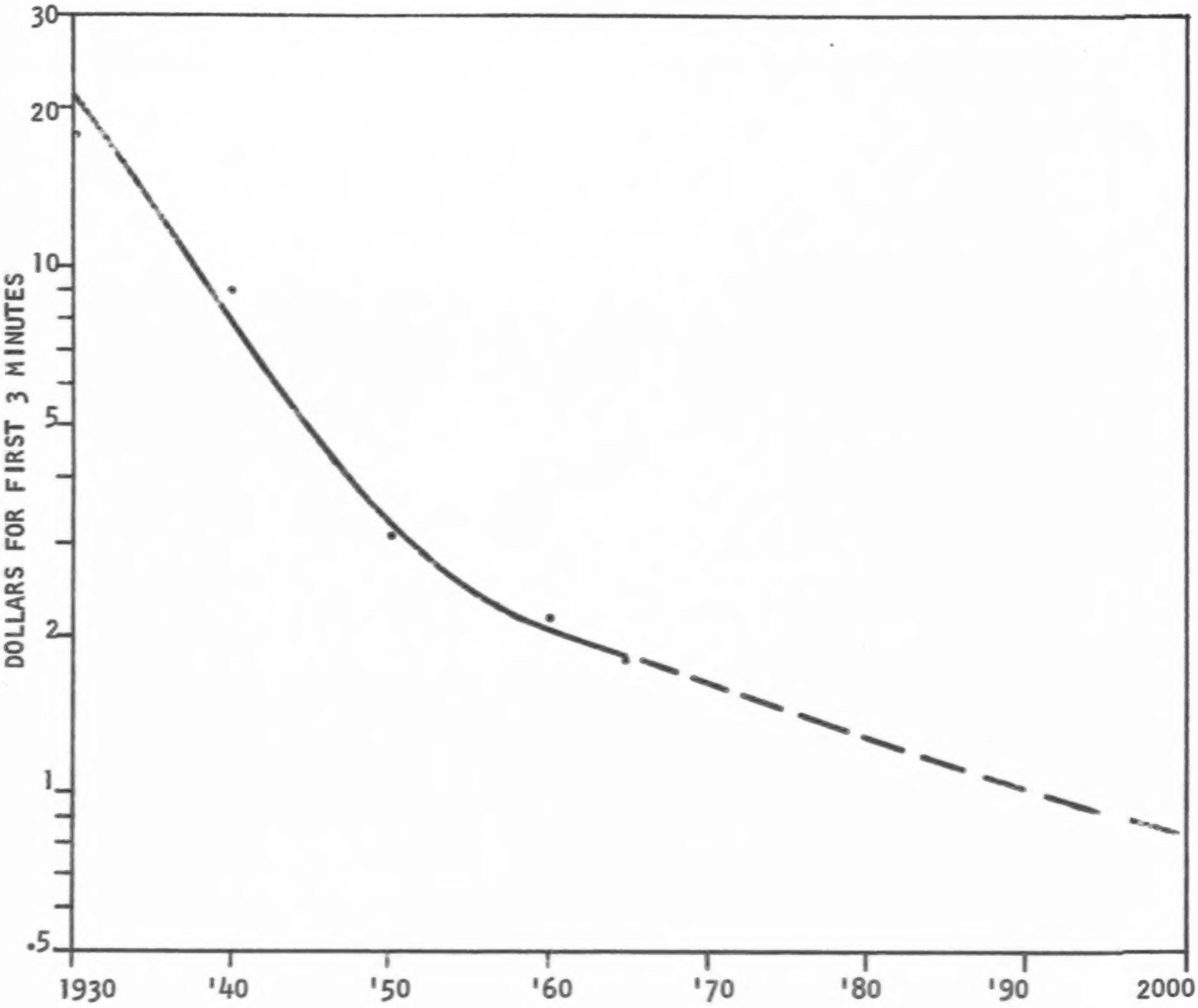
AVERAGE COST OF ELECTRICITY TO INDUSTRIAL USERS
CONSUMING 200,000 KW-HR PER MONTH
(IN 1958 DOLLARS)



Source: History, Series S 78.

Figure 16

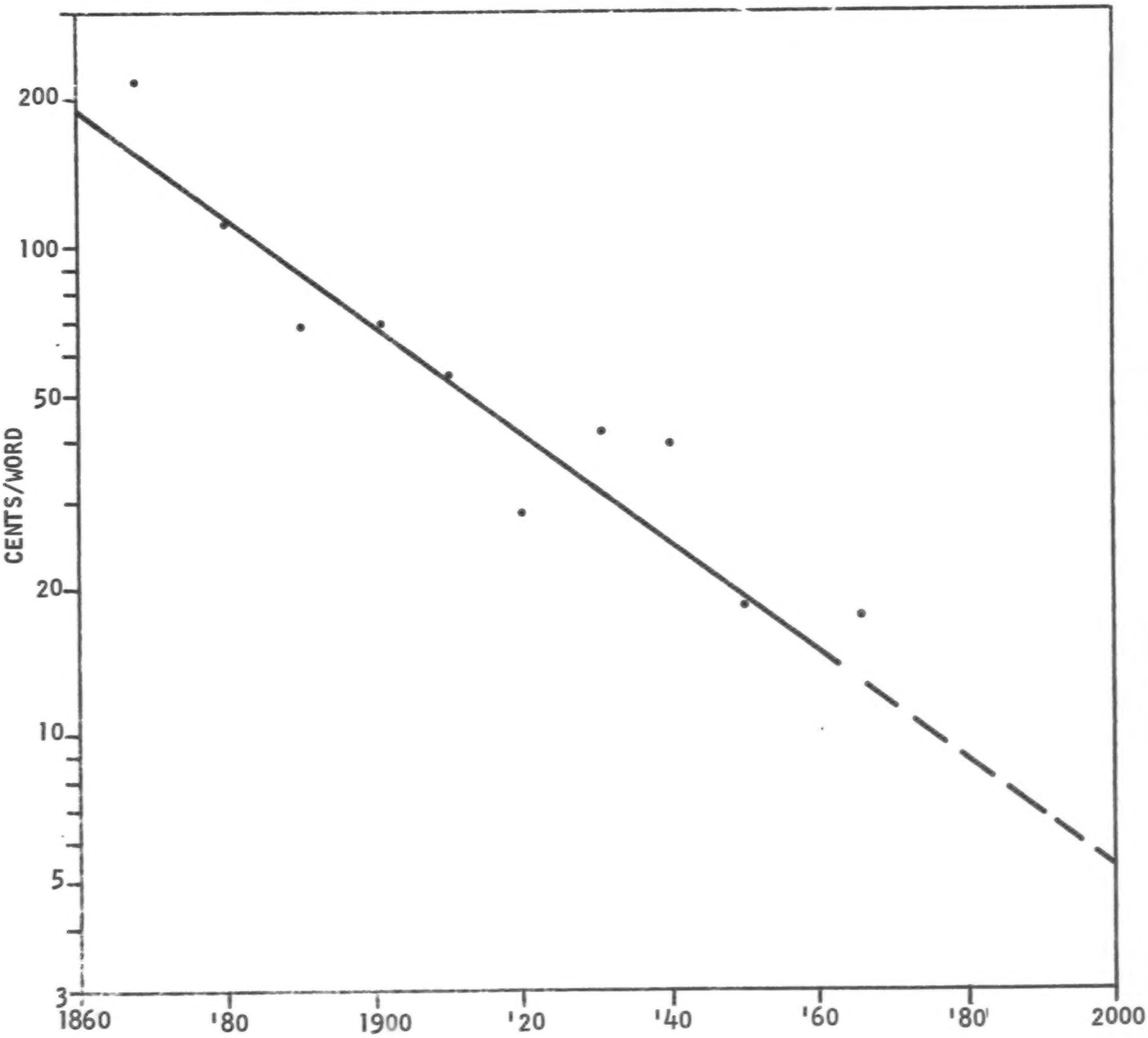
TELEPHONE TOLL CALL RATES: NEW YORK TO SAN FRANCISCO
(IN 1958 DOLLARS)



Sources: History, Series R 13; Abstract, Table 727.

Figure 17

INTERNATIONAL CABLE & TELEGRAPH RATES: NEW YORK-LONDON
(RELATIVE TO 1947-49 WHOLESALE PRICES)



Sources: History, Series E 1, E 13, E 25, R 86; Abstract, Table 736.

will diminish by only a slight amount, if at all. However, very substantial advances in the quality of medical care will occur. Similarly, the major effect of technological innovations in transportation--with the likely exception of air transport--will be to increase speed and improve service rather than reduce costs.

(2) The major reduction in shipping charges will be for air freight. Rail freight rates will fall to approximately one-half their present levels by the end of the century; charges for other means of transportation will decline by lesser amounts. The cost of electricity to industrial users will also drop by about 50 per cent.

(3) Despite the foregoing reductions in real costs to consumers, in the year 2000 consumers will be spending from 45 to 50 per cent of their disposable incomes on food, clothing, housing, utilities and medical care.

(4) The average work week at the end of this century will be approximately 30 hours.

If our future is to be one of neither stagnation nor super-abundance, what quantity of resources will be available for education? Some general estimates of expenditures for education appear in the following section.

Detailed Projections of Student Populations and Education Expenditures*

From 1965 to 2000, the U.S. student population is anticipated to grow from about 53 million to 74 million, or at an average annual rate of about 2% (the year 2000 student population is, of course, a crude first approximation). Over the same period, both public and private expenditures for education will increase from about $30 billion to perhaps $125 billion to $180 billion. Growth rates for total resources available in constant 1965 dollars fall within the range of from 4% to 5-1/2% per year, a rate substantially in excess of the rate at which the student population will increase.

---

*I am indebted to Gus Weiss for assistance in the preparation of this section.

These data do not explicitly imply that educational expenditures of these magnitudes will be made; they do imply, however, that the economic latitude to make dramatic expenditures will exist without placing constraints on other sectors within the economy. Thus what level of educational support will be deemed appropriate during the balance of this century is a matter of social choice rather than economic necessity.

Estimates of the student population are seen in Tables II, III, and IV. These tables are developed from Department of Commerce estimates of enrollment, with extrapolation from other Commerce sources to the end of the century. The "D-1" series was used, implying increasing enrollment rates per age group. This student population was divided into public and private classifications, indicating some increase in private secondary education's share in total secondary education, while private education's share of higher education is projected to decline.

Of some interest is the significant growth of higher education over the balance of the period, compared with the stability of the elementary and high school portion, up to 1985.

Economic data are provided in Tables V, VI, and VII. These data were taken as a "surprise-free" projection, premised on calculations of total potential supply of goods and services to 2000, with the ranges "high" and "low" produced by alternative productivity assumptions, 4% and 2-1/2% per year. Over a forecast period of 35 years this range will produce a substantial interval between the high and low values of the economic variables forecast.*

---

*See The Year 2000, op. cit., Chapter III, for an explanation of details of such projection methods.

The data for state and local government expenditures on education are projected by assuming a small increase in the share of such expenditures in Gross National Product, with compensation by a reduction in Federal Government's share (reflecting an anticipated decline in defense spending following the Viet Nam War). Regarding the state and local total, it was assumed that an approximation of the historical ratio of 37% of total would continue to be allocated to education (see Table VII). Projected expenditures were divided by both (a) number of students in public systems, and (b) the total U.S. population, to achieve appropriate per person expenditure estimates. Over the period 1965-2000 both of these figures will be approximately triple their 1965 values.

Private educational expenditures are also projected according to a simple set of assumptions. Personal consumption expenditures constitute the relevant economic variable for this estimate, with particular focus on the component of private education and research. Private education benefits not only from the growth of personal consumption expenditures over time, but also from the fact that the real cost of certain consumer items (particularly food, clothing, and housing) will decline. Moreover, consumption of some items will not grow as rapidly as consumer income. Thus, the array of consumption choices will widen over time, with one possible beneficiary being education. (Leisure, as a "tradeoff" with income, has already been incorporated in the derivation of aggregate figures.)

There is considerable "slack" in the composition of consumption, which has been reflected in an increase in the sub-sector share relevant to education from 1.4 to 1.8% of total consumption expenditures. This assumption yields private educational expenditures per student and per capita of about the same amount as those representing the public systems.

5

TABLE II

Projections of School Enrollment to Year 2000*
(Millions)

Year	Total Enrolled	Elementary School and High School	Higher Education
1965	53.2	48.0	5.2
1975	58.2	49.1	9.1
1985	59.7	48.6	11.1
2000	74.6	55.6	19.0

TABLE III

Number of Students Enrolled in Public and Private Schools 1975, 1985, and 2000
(Millions)

	1965	1975	1985	1985
Public Schools				
Elementary and Secondary	40.3	40.7	39.6	44.5
Higher Institutions	3.1	6.2	7.8	14.3
Total	43.4	46.9	47.4	58.8
Private Schools				
Elementary and Secondary	7.7	8.4	9.0	11.1
Higher Institutions	2.1	2.9	3.3	4.7
Total	9.8	11.3	12.3	15.8

---

*Data to 1985 are those obtained in "Current Population Reports, Projections of School and College Enrollment in the United States to 1985," Series P-25, No. 338, May 31, 1966. For 2000, Hudson Institute Estimate is based on population projections in Series P-25, No. 286, July, 1964.

TABLE IV

Enrollment by Public and Private Schools to Year 2000
(Millions)

	Institutions of Higher Learning		Elementary and Secondary Schools	
	Public	Private	Public	Private
1965	3.1	2.1	40.3	7.7
1975	6.2	2.9	40.7	8.4
1985	7.8	3.3	39.6	9.0
2000	14.3	4.7	44.5	11.1

TABLE V

Economic Indices*
(Billion 1965 U.S. Dollars)

				Government Purchases of Goods & Services		
		GNP	Personal Consumption	Total	Fed. Government	State & Local
1965		684	432	136	66.8	69.4
1975:	Low	918	583	193	81	112
	High	1,062	674	223	91	132
1985:	Low	1,285	827	265	99	167
	High	1,713	1,098	348	129	219
2000:	Low	2,177	1,452	411	141	270
	High	3,628	2,420	685	236	450

---

*Source: Herman Kahn and Anthony Wiener, The Year 2000: A Framework for Speculation on the Next Thirty-three Years, op. cit., pp. 178-79.

TABLE VI

Resources Available from Private Consumption Expenditure for Support of Private Education
(Billion of 1965 dollars)

	1965	1975	1985	2000
Private Consumption Expenditures	432			
Low		583	827	1,452
High		674	1,098	2,420
Expenditures Devoted to Pri. Education & Research	5.6			
Low		8.2	14.9	26.1
High		9.4	19.8	43.6
Expenditures per Privately Enrolled Student ($ only)	560			
Low		720	1,200	1,650
High		840	1,600	2,750

TABLE VII

Resources Available for Public Education to Year 2000
(Billions of 1965 U.S. Dollars)

	1965	1975	1985	2000
State and Local Purchases of Goods and Services	69.4			
High		112	167	270
Low		132	219	450
Poss. Exp. on Education at 37% of State & Loc. Tot. Exp.	25.5	41.4 48.8	61.8 81.0	99.9 166.5
Exp. Per. Student Enrolled in Public Sec. Schools & Schools of Higher Learning ($ 1965)	600			
High		900	1,300	1,700
Low		1,050	1,700	2,800
Per Capita Education Exp. by State & Loc. Government	130			
High		185	240	310
Low		220	310	510

TABLE VIII

All Educational Expenditures
(Billions of 1965 U.S. Dollars)

	1965	1975	1985	2000
Historical	31.1			
Low		49.6	76.7	126.0
High		57.8	100.8	210.1

Conclusion

During the remainder of this century at least, economic considerations will continue to play an important role in the career plans and educational decisions of students. Along with the continuing advance of technology, educational requirements will also increase gradually. For many occupations the number of years of formal education will tend to grow. But perhaps toward the end of the century, the importance of economic considerations in decisions about education will begin to diminish. As the foregoing discussion has pointed out, the net effect on education of greater affluence and increased leisure is ambiguous. Persons who enjoy being educated will tend to consume more education as their incomes rise and as their leisure hours increase in number. However, other individuals who regard education as a somewhat onerous, if essential, investment will spend less on education as economic pressures ease. Consequently, the day may come when virtually all Americans receive high school or junior college educations, but when few take graduate degrees for economic reasons. Thus, depending upon population trends, total demand for formal preliminary education may stabilize or even begin to diminish slowly. Also towards the end of this century, interest in applied science and technical subjects may begin to dwindle relative to concern about the humanities, and we may expect greater latitude for experimentation in educational systems and techniques.

HI-1043-RR

PART FIVE

NOTES ON WORLD-WIDE SCHOOL ENROLLMENT AND ILLITERACY TO THE YEAR 2000

By

Mark Wehle

(With notes on U.S. graduates
prepared by Laurie C. Rockett)

TABLE OF CONTENTS

Page

I. School Enrollment. 5-1
  A. Definitions and Data. 5-1
  B. History 5-8
  C. Forecasts 5-16
  D. Notes and Sources . . . . 5-18 - 5-20

II. Illiteracy 5-21
  A. Introduction. 5-21
  B. Literacy and Education. 5-24
  C. History 5-29
  D. Forecasts 5-32

III. U.S. Graduates 5-35

Tables

I. Primary Plus Secondary Enrollment as Percentage of School Age Population ("Enrollment Ratio") . . . . .5-3 - 5-4
II. Rank Comparison of School Enrollment Ratios, 1963 & 2000 . . 5-5
III. Analysis of the Three Cases Where Most Recent Enrollment Ratio Was Below That of 1950. 5-16
IV. Index and Summary for Illiteracy 5-22
V. Rank Comparison of Illiteracy Rates, 1963 & 2000 5-23
VI. Rank Comparison of School Enrollment and Illiteracy Rates, 1963 5-25
VII. Possible Effect of Adult Education in Brazil, 1950-60. . . . 5-28

Charts

A. Primary and Secondary School Enrollment As Percentage of School Age Population (U.S., France, U.S.S.R., Costa Rica) . 5-9
B. Primary and Secondary School Enrollment As Percentage of School Age Population (U.K., Japan). 5-10
C. Primary and Secondary School Enrollment As Percentage of School Age Population (Romania, W. Germany, E. Germany, Sweden). 5-11
D. Primary and Secondary School Enrollment As Percentage of School Age Population (Australia, Canada, Mexico, Argentina, Italy, Egypt, India, Pakistan) 5-12
E. Primary and Secondary School Enrollment As Percentage of School Age Population (New Zealand, Israel, Philippines Poland, Czechoslovakia). 5-13

TABLE OF CONTENTS (Cont'd)

Charts (Cont'd)

F. Primary and Secondary School Enrollment As Percentage of School Age Population (Taiwan, Colombia, Brazil, China, Thailand, Syria, Indonesia, Nigeria). 5-14
G. Population 15 and Older Illiterate. 5-30
H. Population 15 and Older Illiterate. 5-31
I. Population 15 and Older Illiterate. 5-33
J. Increase in Educational Attainment in the U.S. 5-36

NOTES ON WORLD-WIDE SCHOOL ENROLLMENT AND ILLITERACY TO THE YEAR 2000*

Following are actual or extrapolated figures for 1963 and preliminary forecasts to the year 2000 for 31 countries including the U.S.:

	1963	Forecast to 2000
Number of countries where primary and secondary enrollment is below 50 per cent of school-age population	5	1
Number of countries where illiterates are more than 50 per cent of population 15 and older	6	3

(SOURCE: Tables II and V.)

The 31 countries are listed in Table I and were chosen because they are large or representative. Reported figures are accepted at face value, disregarding possible variations in credibility among governments. Forecasts are simple extension of trend by eye without study of individual countries. School enrollment will be discussed first and then illiteracy.

I. SCHOOL ENROLLMENT

In this part enrollment is the only subject covered. No attention is paid to its distribution between primary and secondary school, the quality of the teaching, or the relevance of the curriculum to the needs of the pupils.

A. DEFINITIONS AND DATA

Table I shows primary plus secondary enrollment as a percentage of school-age population ("enrollment ratio") for 1818-1963 and as forecast to the year 2000. It also serves as an index to the charts that follow.

---

*Paul Berry and Raymond Gastil made valuable contributions to this paper, but are not responsible for the accuracy of the data or for the forecasts. For notes on U.S. graduates by Laurie C. Rockett, see part III.

Table II again gives enrollment ratios, but for 1963 and 2000 only, with the countries ranked in order in each year. The slanting lines show the changes in rank. The most developed countries stand generally at the top of the lists and the less developed at the bottom; however, certain developed countries--Canada, the two Germanies, and Sweden--stand much farther down than would be expected from their per capita income.

The age span for the school age population is estimated by Unesco separately for each country to correspond "more nearly...to the actual duration of schooling" than does the 5-19 year bracket commonly used. The school age concept enables enrollment ratios to be compared among countries, despite the fact that in one country children may start at 5 and graduate (when they do) at 16, and in another start at 7 and graduate at 18. School age here need not agree with compulsory school ages.* Unesco does not apparently publish the school age population figure, using it only as the denominator of the age-adjusted enrollment ratio which it does publish.

Enrollment for the numerator of the ratio is measured at the start of the school year** and should not be confused with attendance, which may be as little as half of it.*** Enrollment:

---

*See United Nations Educational, Scientific and Cultural Organization ("Unesco"), Statistical Yearbook. 1965, notes to Tables 7 and 9. Using Unesco's population of school age instead of population 5-19 in the denominator of the enrollment ratio is a departure from the April 1966 version of this paper for better comparability and forecasting. The figure of 100 (perhaps more than 100 because of adult education) serves as an upper limit to the forecasts. Previously, for the U.S., the use of 5-19's limited the ratio to something above 80, since graduation from high school is at perhaps age 17; and different limits might obtain for other countries.

**Unesco, Statistical Yearbook, 1965, p. 86.

***U.N., Dept. of Social Affairs, Preliminary Report on the World Social Situation (New York, 1952), p. 61.

TABLE I

PRIMARY PLUS SECONDARY ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION ("ENROLLMENT RATIO"), Per Cent

					1885-90		1926-38						
	Chart	1830	1850	1878	Year	%	Year	%	1950	1955	1960	1963	2000
U.S.[a]	A	75	74		1890	83	1930	95	100	102	102	100	101
Africa													
Egypt	D				1887	7	1932	21	25	36	43	48	65
Nigeria	F						1933	4	14	22	30	27	40
N.America													
Canada	D	15		58	1887	56	1932	70	71	79	81	80	94
Costa Rica	A				1885	27	1937	44	51	70	76	84	98
Mexico	D				1887	13	1932	42	40	47	58	68	90
S.America													
Argentina	D				1888	16	1932	49	64	72	72	73	85
Brazil	F						1933	23	30	37	51	58	80
Colombia[a]	F						1937	42	30	41	50	60	90
Asia													
Mainland China	F						1937	12	20	35	58[b]		92
India	D				1888	4	1932	13	21	25	34	38[c]	57
Pakistan	D								20	23	26	30	50
Indonesia	F						1936	13	27	37	41	44[d]	65
Israel	E								73	89	92	83	96
Japan[a]	B				1888	30	1932	69	86	92	91	86	96
Philippines[a]	E						1932	35	89	70	70	76[c]	96
Syria	F						1937	20	35	36	45	53	68
Taiwan	F						1932	25	47	57	74	79	95
Thailand	F						1932	22	44	46	54	55	70

(CONTINUED)

TABLE I (CONTINUED)

	Chart	1830	1850	1878	1885-90 Year	1885-90 %	1926-38 Year	1926-38 %	1950	1955	1960	1963	2000
Europe													
Czechoslovakia	E						1936	93	76	79	85	87	98
France	A	31	47	62	1886	71	1932	76	78	87	95	94	101
E. Germany	C	65	61	64	1885	68			84	79	78	78	88
W. Germany	C								91	87	82	85	95
Italy	D	11		25	1885	37	1932	51	53	57	59	62	75
Poland	E						1938	65	70	68	85	90	100
Romania	C				1883	9			47	50	71	82	97
Sweden	C	54	50	54	1886	58			75	83	80	77	86
U.S.S.R.	A		8	8	1885	16	1926	41	83		78	97	101
U.K.[a]	B	31	40	51	1886	54	1932	82	76	83	82	93	100
Oceania													
Australia	D	16		65	1888	45	1932	63	83	80	93	90	100
New Zealand	E						1932	76	88	92	92	90	100

[a] Not shown above:

Country	U.S.								Colombia		Japan	Philippines		Eng. & Wales
Year	1860	1880	1900	1910	1920	1940	1975	1985	1976	1981	1902	1975	1980	1818
Enrollment ratio	79	90	86	86	91	98	98	101	72	80	46	87	96	19

[b] 1958

[c] 1962

[d] 1961

NOTES AND SOURCES: 1818-1985: see section D, below; 2000: read from charts A-F.

TABLE II

RANK COMPARISON OF SCHOOL ENROLLMENT RATIOS, 1963 & 2000

	Per Cent of School Age Population Enrolled		
	1963	2000	
U.S.	100	101	U.S.
U.S.S.R.	97	101	U.S.S.R.
France	94	101	France
U.K.	93	100	U.K.
Poland	90	100	Poland
Australia	90	100	Australia
New Zealand	90	100	New Zealand
Czechoslovakia	87	98	Czechoslovakia
Japan	86	98	Costa Rica
W. Germany	85	97	Romania
Costa Rica	84	96	Japan
Israel	83	96	Israel
Romania	82	96	Philippines
Canada	80	95	W. Germany
Taiwan	79	95	Taiwan
Philippines	78	94	Canada
E. Germany	78	92	Mainland China
Sweden	77	90	Mexico
Argentina	73	90	Colombia
Mexico	68	88	E. Germany
Italy	62	86	Sweden
Mainland China	61	85	Argentina
Colombia	60	80	Brazil
Brazil	58	75	Italy
Thailand	55	70	Thailand
Syria	53	68	Syria
Egypt	48	65	Egypt
Indonesia	44	65	Indonesia
India	39	57	India
Pakistan	30	50	Pakistan
Nigeria	27	40	Nigeria

SOURCE: Table I and extrapolations from charts A-F. Tied countries are arranged to minimize crossing over.

Includes	Excludes
All public and private schools	Kindergarten
Part-time[*] and full-time students	Correspondence schools[**]
Teacher training schools not requiring a secondary diploma for entrance	

Deviations from the definition are supposed to be footnoted by Unesco. However, Unesco sometimes footnotes a figure that complies with its definition--for instance, Costa Rica's 1963 primary enrollment ratio says "includes evening schools"--which creates doubt whether part-time students are generally included for other countries Unesco's major footnotes are repeated in section D, below.

It should be borne in mind that some of the exclusions mentioned in these footnotes may cause a perceptible understatement of enrollment, hence of enrollment ratios. For instance, ratios for England and Wales are said to exclude vocational schools and teacher training in 1926-60, but to include them since. On the basis of figures for 1961, vocational schools contained about 13 per cent of all U.K. enrollment, so that the 1926-60 ratios are seriously understated. This accounts for the sharp jump in the U.K. enrollment ratio in Chart B. No corrections have been made to any country's data in such cases, except for the removal of kindergarten from those for the U.S.

Enrollment ratios for before 1950 were obtained originally as percentages of population 5-19, or else of total population, which were then multiplied by the fraction of 5-19's to the total. The chief sources (see section D) are an article by R. Easterlin and, for the U.S., Historical Statistics and the Statistical Abstract. The percentages of population 5-19 were converted to percentages of school age population by multipliers computed from Unesco. (Unesco gives enrollment ratios for 1950-63 in two forms, first as a ratio to 5-19's and secondly as a ratio to population of school age; dividing the latter ratios by the former for each country gave the multipliers.)

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[*] Unesco, "Recommendation Concerning the International Standardization of Educational Statistics," in Records of the General Conference, 10th Session, 1958, Conventions and Recommendations (Paris, 1959), pp. 93-96 (the recommendation was adopted).

[**] These are not excluded by name, but exclusion may be inferred. For a school is a group of students and a class is a group of students instructed together. Unesco, Statistical Yearbook, 1965, p. 85, and "Recommendation."

Because of the rough and ready way the data were handled first in the sources and then here, the present paper can provide only a very approximate idea of the history of school enrollment before 1950. First, before the start of Unesco-compiled figures in 1930, there could have been little attempt to apply a consistent definition of enrollment either among countries or over time. Thus, for the U.S., the Census Bureau's enrollment ratio for 5-19's is 14 points below that of the Office of Education in 1890, the first year of overlap of the two sources. Second, in going from percentage of 5-19's to percentage of school age population, the use of multipliers constant over time (see the last paragraph) implies that school age did not change over a century and a half. Finally, the use of secondary sources for enrollment and age distribution must introduce further errors and noncomparabilities. For instance, the 1830 and 1878 ratios of enrollment to total population are unaccompanied in their source by any hint of their derivation, and the 1878 ratio for Australia plus Canada, which are combined in that source, is slightly above Canada's 1885 ratio and much above Australia's. All three of these ratios appear in the Easterlin article cited; they are 21 per cent in 1878 as against 20 and 14 per cent in 1885. These differences are probably in the wrong direction considering the long-run upward trend. Because of all these deficiencies in the data, the reader is cautioned against paying too much attention to irregularities in the movement of the ratios.

Finally, the credibility of the enrollment data rests entirely on the word of the governments providing them to Unesco, which passes them on essentially as reported. Some of the spectacular rises in enrollment in one-party countries could be fictional. But they do not have to be, because in such countries expenditures on education, as for any other purpose desired by the state, can be carried through with relatively little regard for the taxpayer.

B. HISTORY

The ratio of school enrollment to school age population in the U.S. and developed Western Europe stood above 40 in the middle of the nineteenth century and rose gradually to 80 to 100 per cent now (Charts A-C). In the rest of the New World and in Japan, Russia, and Romania it rose from 10 or 20 more steeply to about this same level (Charts A-D). Since 1950 very steep increases indeed are seen for all underdeveloped countries (Charts D-F), as well as for Poland and Romania.

More detailed conclusions are:

1. The United Kingdom's enrollment ratio of 19 in the year 1818 suggests that widespread formal education was not needed in the early stages of industrialization.

2. Germany's ratio of 65, Sweden's of 54, and the U.S. ratio of 75*

---

*Or possibly as little as 48. The 1830 figure of 48 per cent is from a secondary source which refers to no primary source. The procedure used here, of multiplying that figure by the 1890 ratio of the Office of Education to the Census, assumes without proof that it is on the Census level.

CHART A

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION

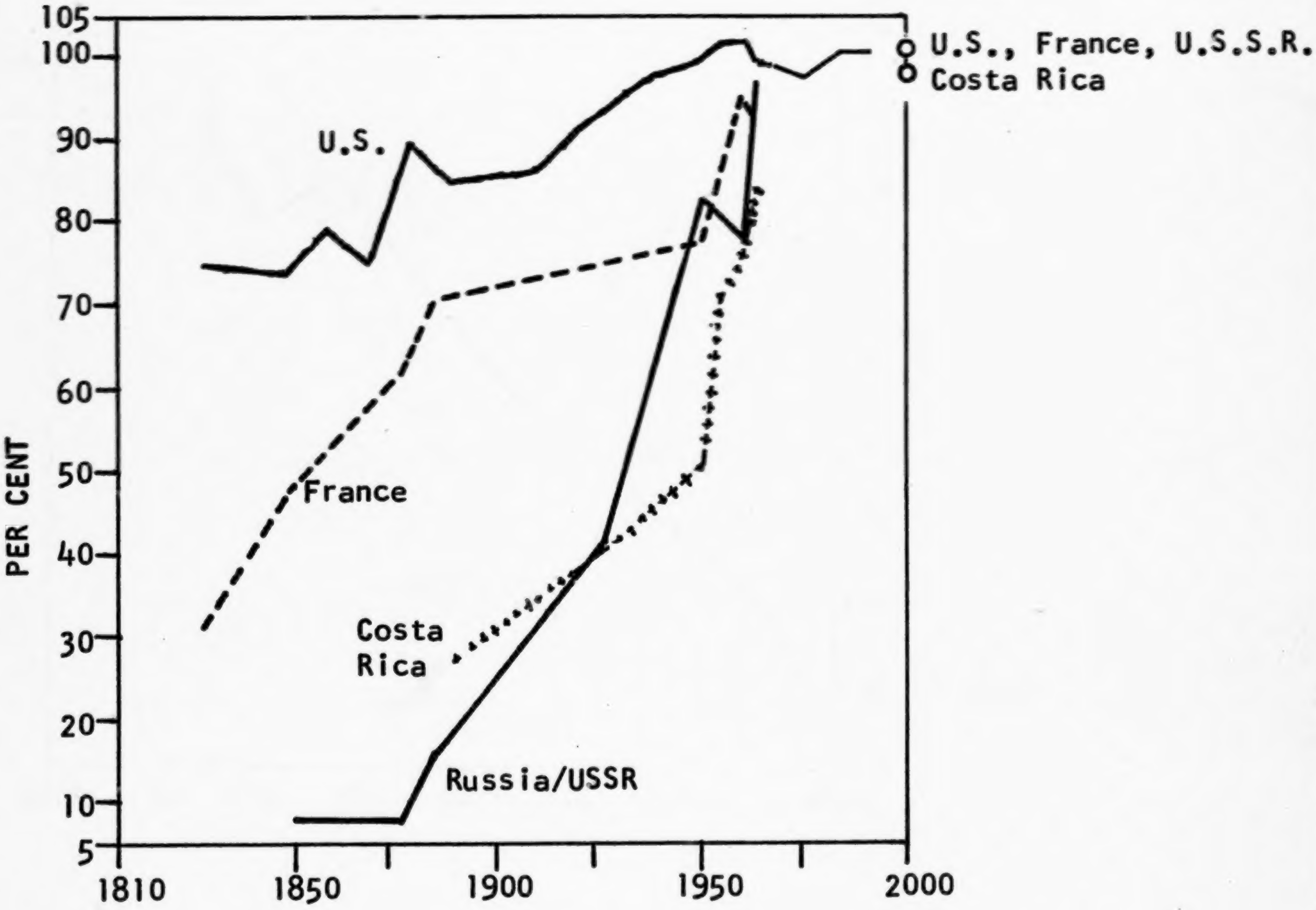


CHART B

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION

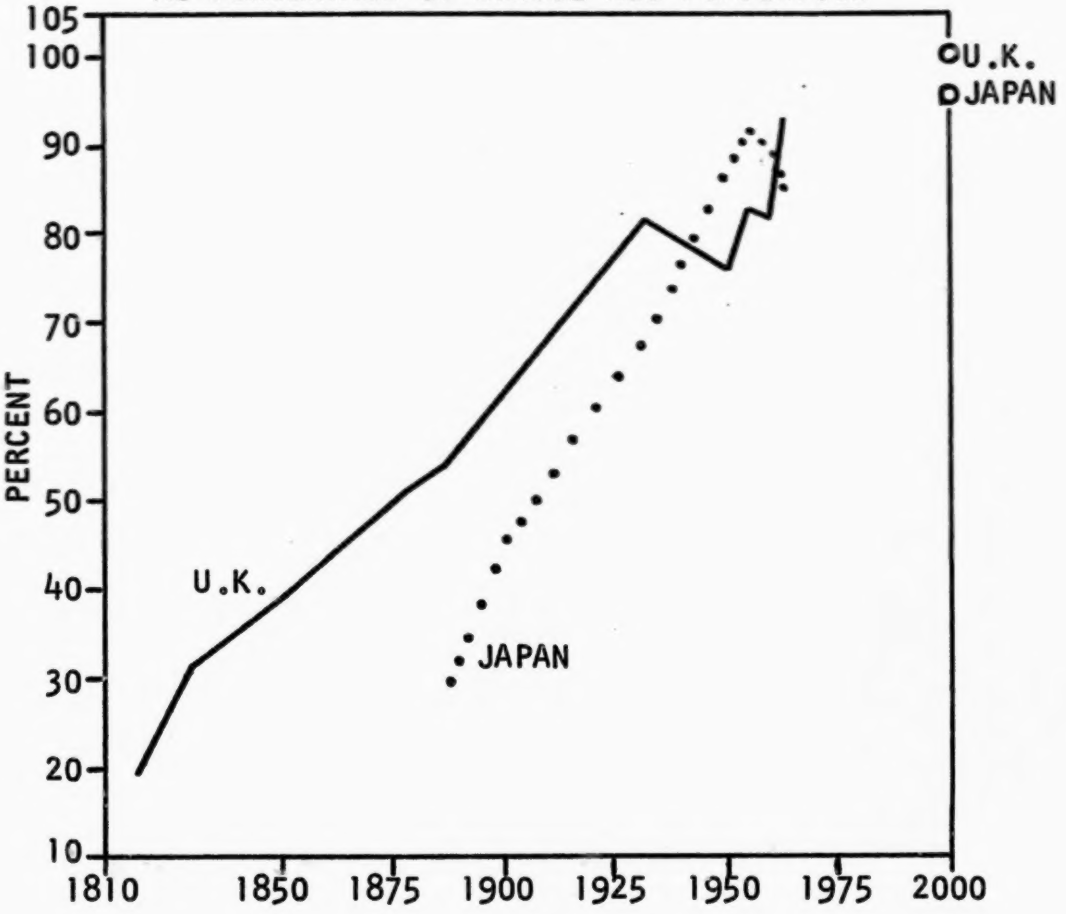


CHART C

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION

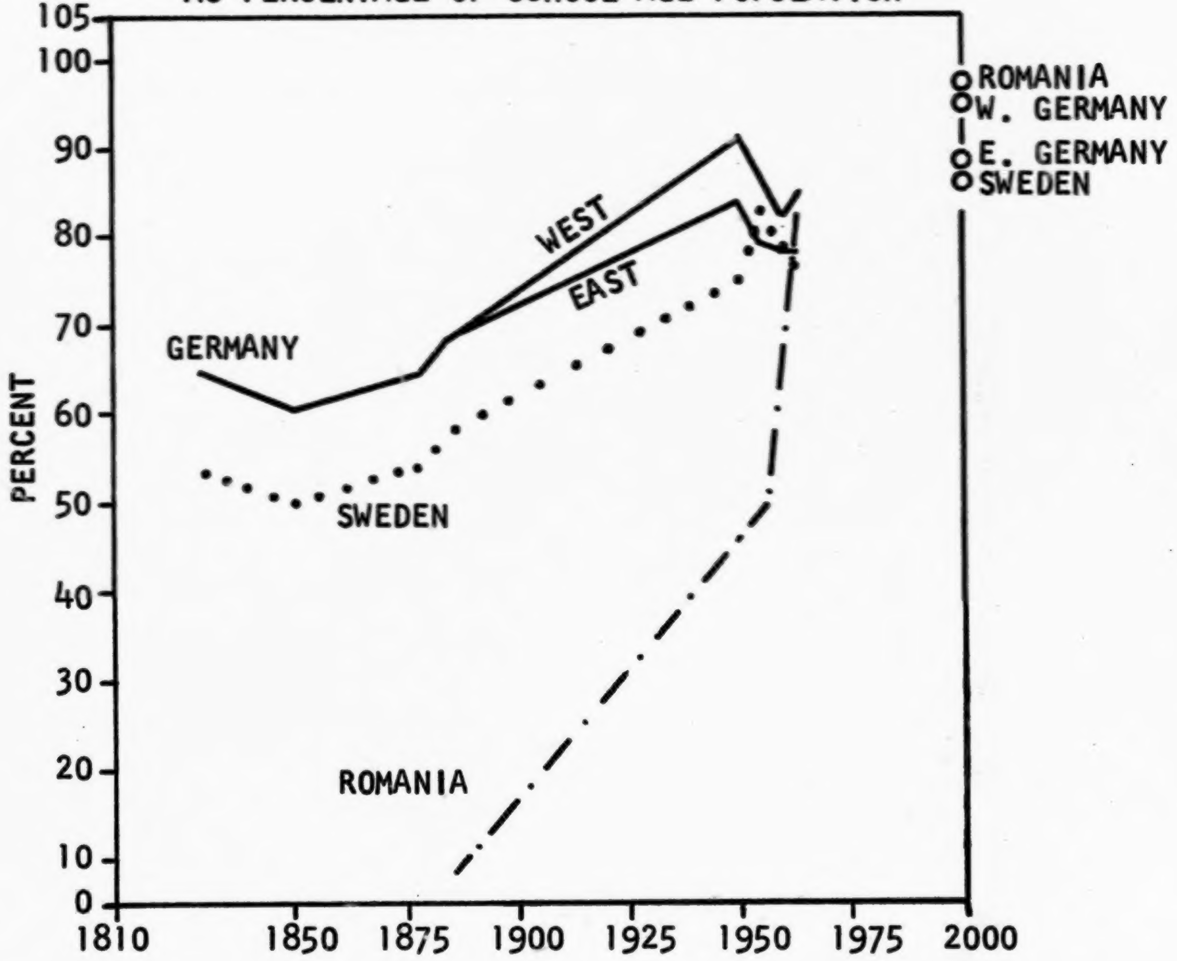


CHART D

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION

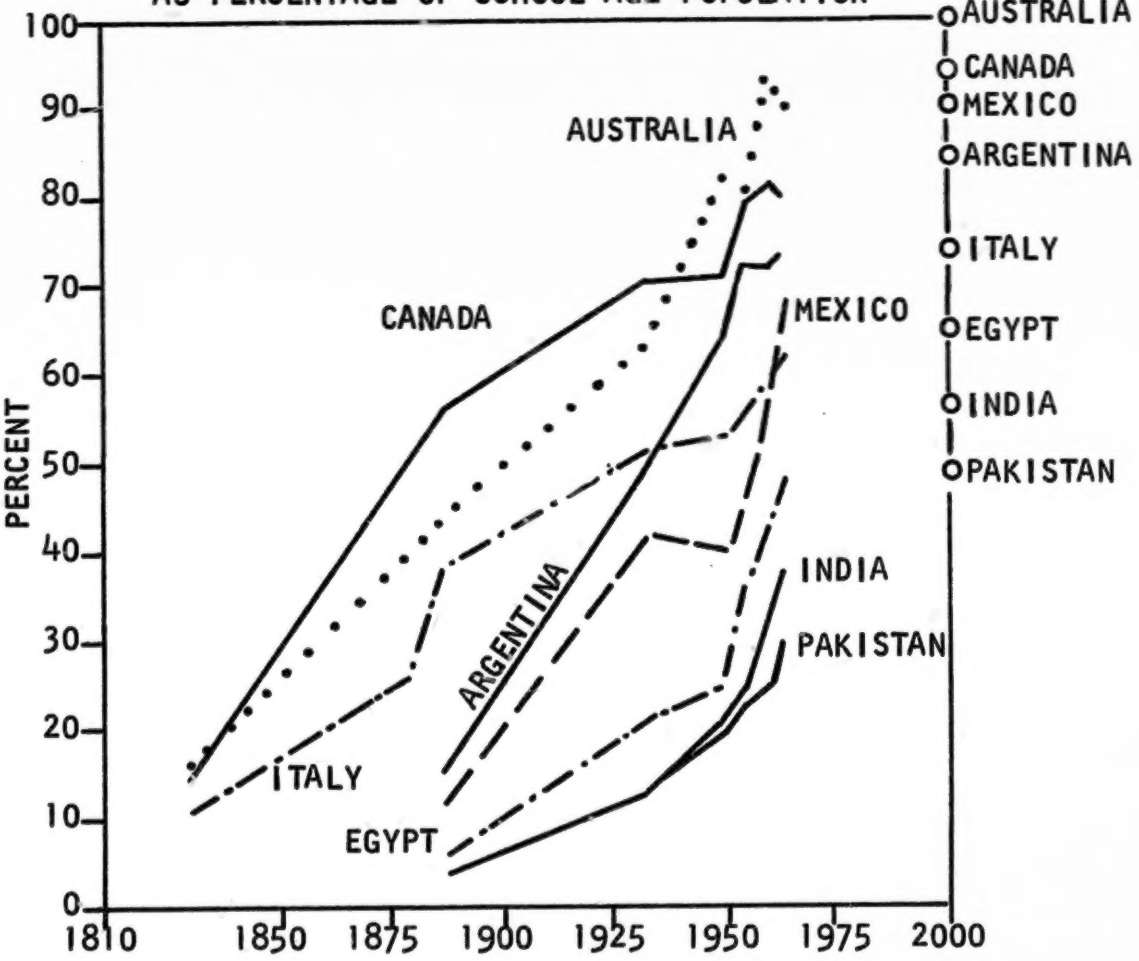


CHART E

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION

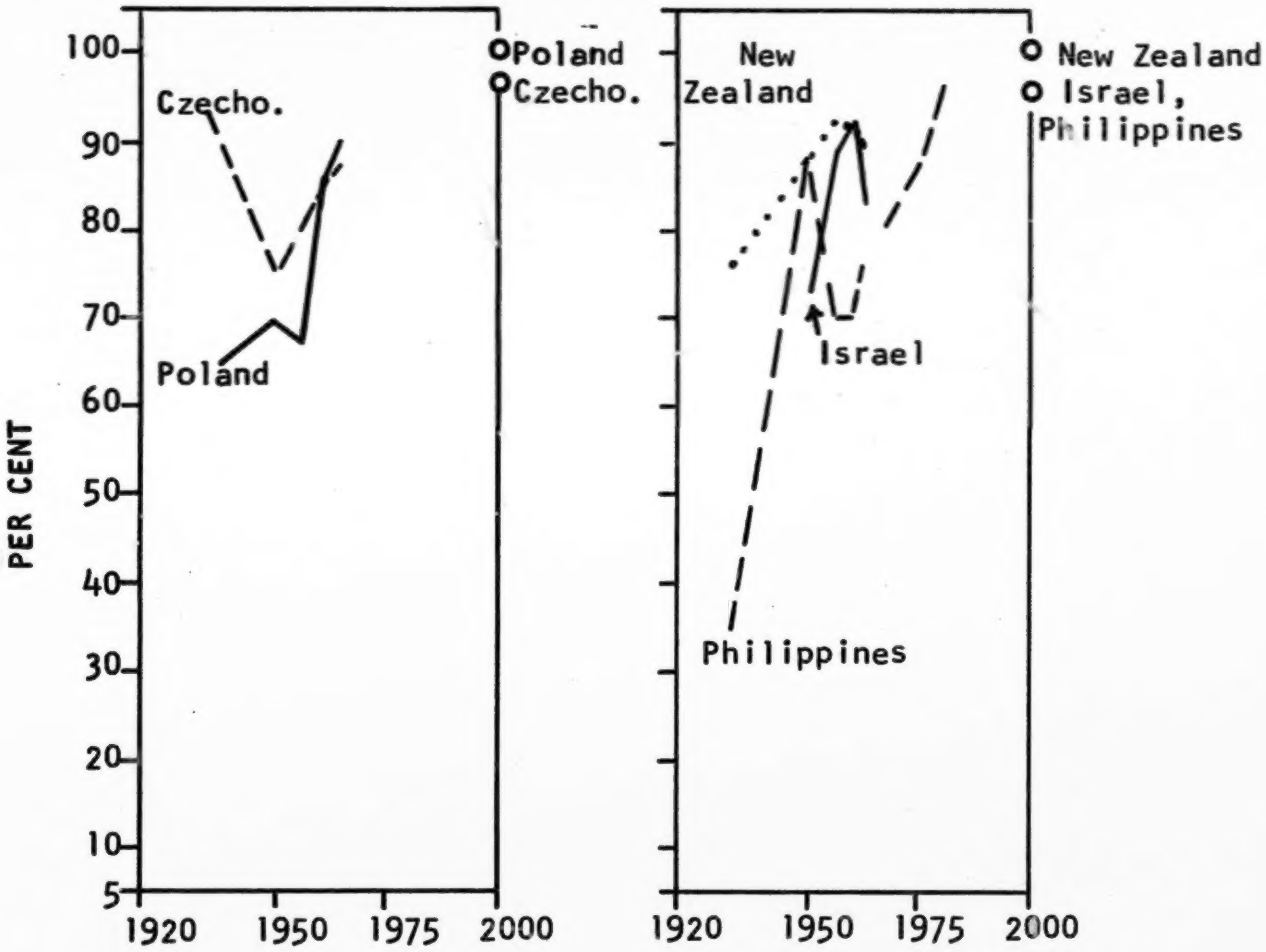
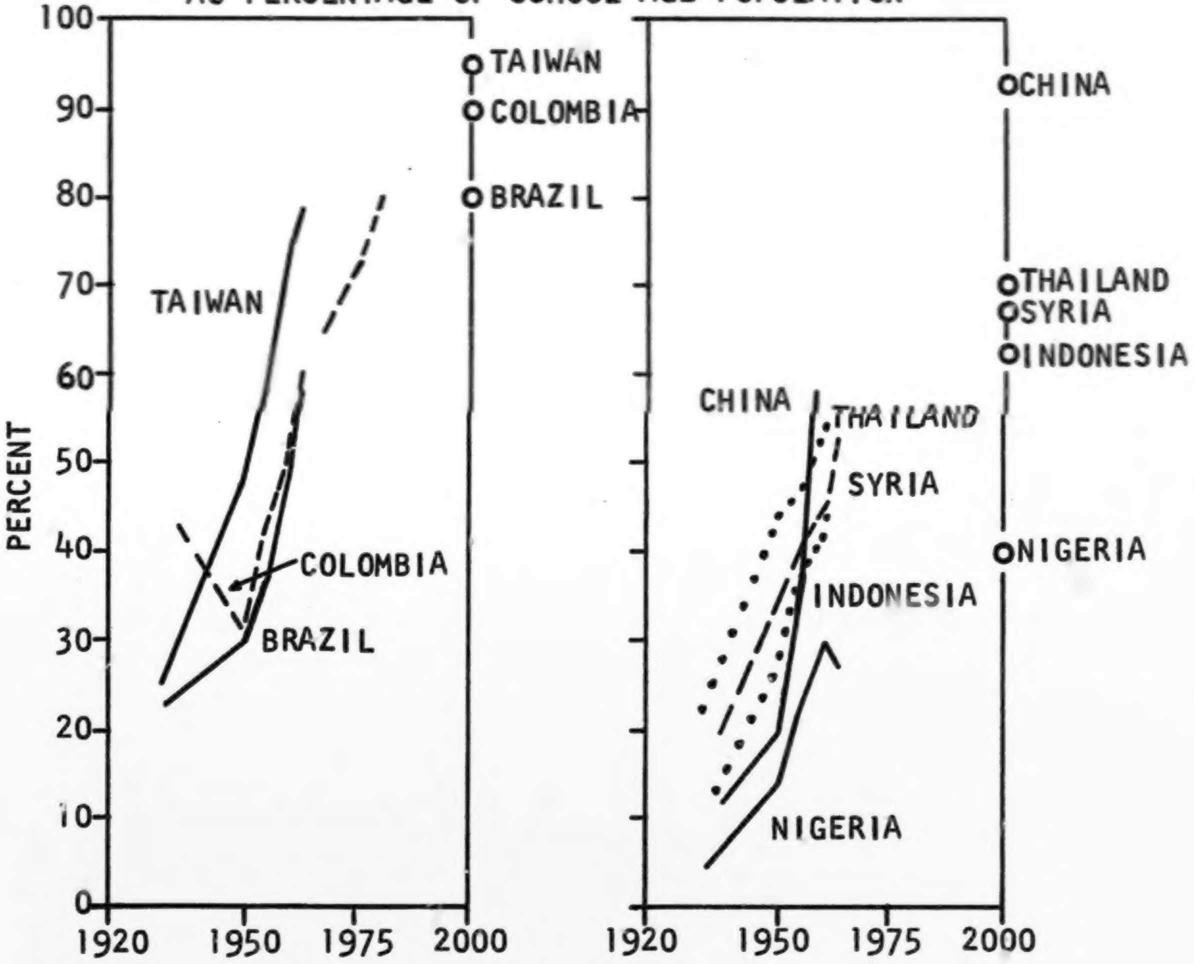


CHART F

PRIMARY AND SECONDARY SCHOOL ENROLLMENT AS PERCENTAGE OF SCHOOL AGE POPULATION



twelve years afterward suggest that such education was a help to countries that adapted British experience to their own industrialization. Likewise, Japan's ratio passed 60 in 1920, long before that country's exports had diversified from textiles into automobiles, machinery, and instruments.

3. The case of Italy, whose enrollment ratio rose much slower than those of its northern neighbors, may illustrate a connection between lack of education and poverty. Poverty provides an incentive to keep children at work instead of in school, and the lack of schooling helps to keep the next generation poor.

4. The steepness of the curves for Japan, U.S.S.R., and the present-day underdeveloped countries illustrates the effect on enrollment of an active interest on the part of government, which, for instance, has brought the reported enrollment ratios of Costa Rica and Taiwan above that of East Germany.

5. The contrast between the enrollment ratios of the two Germanies in 1950-63 boosts the credibility of East German enrollment data; it would have been easy to add a few hundred thousand to compare better with West Germany.

6. Three countries--the Philippines and the two Germanies--experienced reductions in their enrollment ratios 1950-63. The extent to which these were due to changes in enrollment and changes in school age population is shown in Table III. In the Philippines, rising enrollment lagged behind faster rising population, while in the Germanies falling enrollment outdistanced falling or stationary population. (This assumes no unexplained change in the way the three governments computed their enrollments.)

TABLE III

ANALYSIS OF THE THREE CASES WHERE MOST RECENT ENROLLMENT RATIO WAS BELOW THAT OF 1950

	Most Recent Year	Per Cent of Itself Since 1950 by Which		
		School age enrollment ratio changed (1)	Enrollment changed (2)	School age population must have changed (3)
Philippines	1962	-15	+23	+44
East Germany	1963	- 7	-22	-16
West Germany plus West Berlin	1963	- 7	- 7	0

SOURCE: Cols. 1 and 2 computed from Unesco, Statistical Yearbook, 1965, tables 7 and 11-13. Col. 3 is $100\left(\left[100 + (2)\right] / \left[100 + (1)\right] - 1\right)$.

C. FORECASTS

The forecasts are simple extensions of the trend by eye* and are subject as well to the inaccuracies of the past data mentioned in section A.

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*In the April 1966 version of this paper, the forecasts for some countries were made using the tracing of the curve for another country with longer statistical history. This procedure was discarded because, with the school age population replacing 5-19's in the denominator of the enrollment ratio, 100 becomes (approximately) the ratio's upper limit for all countries, and because the addition of 1963 gives another year of data to work with. Forecasting thus becomes easier and more accurate.

To compare the new forecasts with the old, they were adjusted to the level of the old by dividing by the ratios of Unesco's enrollment percentage based on school age population to that based on 5-19's. The average new forecast as converted to the old basis was 72, the average old 71 (both unweighted by size of country), a 1-point rise. However, the average difference without regard to sign was 7 points. The year 2000 forecasts for Colombia, Brazil, Indonesia, India, and Pakistan went up 14, 12, 12, 12, and 10 points because of (1) steep increases 1960-63; (2) for Indonesia, the change in regime; and (3) in the case of Colombia and Brazil, the appearance of Mr. Liu's 1985 forecast for Colombia (which should bear also on what may be expected in Brazil). The forecasts for Israel and Japan went down 13 points each because of better forecasting due to the substitution of school age population for 5-19's in the denominator of the enrollment ratio, setting a limit of around 100 on that ratio. These reasons also cover the other changes in the forecasts.

No country was studied individually. However, for the U.S., Colombia, and the Philippines use was made of forecasts already published (see the next section).

Mechanical forecasts as here can take account only of forces which are reflected in the past trend. Educational television and teaching machines seem too recent to appear in the trend and are so neglected.

The curves are made to level off approaching 100. This reflects the smaller degree of popular support for universal secondary education than for universal primary education, the difficulty in training teachers and keeping them in the country, the existence in such countries as Mexico of large indigenous populations with separate languages and customs, and finally, in many countries, the rapid growth of population which keeps per capita income low and so restricts the capacity to pay taxes and support education.

Difficulties in teacher supply are being dealt with in Africa by the rapid expansion of secondary enrollment. In 1961 only 3 out of 35 African countries, members of U.N. Economic Commission for Africa, had 5 per cent or more of children of secondary school age in secondary school.* The figure is now 27 out of 46 independent countries reporting to Unesco.

Table II, reflecting the divergent slopes of the curves on the charts, shows much crossing over in rank among countries in the middle range. The Philippines, mainland China, Mexico, and Colombia are thus forecast by the year 2000 to join Costa Rica and Taiwan in exceeding East Germany and Sweden in enrollment ratio.

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*Conference of African States on Education in Africa, Addis Ababa, May 1961, Final Report (Paris: Unesco, 1961), Table 1, p. 7, cited in Adam Curle, Educational Strategy for Developing Societies (London: Tavistock, 1963), pp. 86-87.

D. NOTES AND SOURCES

U.S. 1830-1940

1830. Enrollment as a percentage of population of all ages was obtained from R.A. Easterlin, "A Note on the Evidence of History," Education and Economic Development, C.A. Anderson and M.J. Bowman, eds. (Chicago: Aldine, 1965), pp. 426, 428. (Easterlin's article, suggested by Paul Berry, also provided most of the other references in this Part.) Population 5-19 as a percentage of all ages was estimated from U.S. Bureau of the Census, Historical Statistics of the United States: Colonial Times to 1957 ["Historical Statistics"] (Washington, 1960), p. 10. The first percentage was divided by the second. The Easterlin figure was assumed to be on the Census level, so the quotient was raised to the Office of Education level by multiplying it by the 1890 ratio of the Office of Education percentage (see "1890-1920" below) to the Census percentage (Historical Statistics, Series H-374). The result was in turn raised to the level of the Unesco school age series by multiplying by the 1950 and 1960 ratio of percentage of school enrollment to 5-19's (Unesco, Statistical Yearbook, 1965 [Paris, 1966], Table 9) to the Office ofEducation percentage (see "1950-63" below) and again by the 1950-63 ratio of Unesco's percentage of school enrollment to persons of school age to their percentage of school enrollment to 5-19's (Unesco, Table 9).

1850-80. Percentages from Historical Statistics, Series H-374, were cut to eliminate higher education and adjusted as for 1830.

1890-1920. Pupils from Historical Statistics, Series H-223 (less, for 1920, estimated kindergarten) were divided by population 5-19 from ibid., p. 10, and adjusted to the Unesco school age level as above.

1930-1940. Pupils from Statistical Abstract, 1966, p. 107, were divided by population 5-19 from ibid., p. 24, and adjusted to Unesco school age level.

1818-78 and 1902, except U.S.

Enrollment as percentage of population of all ages: Easterlin, op. cit., pp. 426, 429. University students are included in 1850 and 1902 but numbers are negligible. The 1878 figures for Australia and Canada seemed too high compared with 1887-88: Australia would have had to fall 21 points, or one-third, in a decade, oppositely to the trend, and Canada 4 points; 1878 was therefore not used for these two countries. The German data of 1850 cover two-thirds of Germany. U.K. data include present Irish Free State in 1830 and 1878, but in 1818 and 1850 refer to England and Wales only. Russian data of 1850 are for European Russia only.

Population 5-19 as percentage of all ages: copied or, sometimes with the aid of graphs, interpolated or extrapolated from secondary sources. Earliest data used for the countries are: Canada 1881, France 1778, Germany and Italy 1871, Sweden 1830, and U.K. (island of Britain only) 1841. U.S.S.R. and Australia were assumed the same as in 1897 and 1901, respectively.

Population of school age as ratio to population 5-19: used 1950-63 figures calculated from Unesco, Statistical Yearbook, 1965, Table 9.

The first percentage was divided by the second and multiplied by the third.

1883-88 except U.S.

Like 1818-78 and 1902 except:

Enrollment as percentage of population of all ages. Egypt, India, Japan, and Australia from M.G. Mulhall, The Dictionary of Statistics (4th ed.: London, 1899), p. 231. Other countries: U.S. Commissioner of Education, Annual Report, 1888/89, Vol. I (Washington, 1891), pp. 76-77.

Population 5-19 as percentage of all ages. Egypt, Argentina, India, and Romania were assigned their percentages for 1907, 1895, 1931, and 1912, respectively. Mexico's was assumed the same as Argentina's.

1926-39 except U.S.

U.S.S.R. Enrollment as percentage of population of all ages: International Bureau of Education, L'Organization de l'Instruction Publique dans 53 Pays (Geneva, 1935), population from start of section on U.S.S.R. and pupils from end of section, covering European Russia only, with two-thirds the total population. Population 5-19 as percentage of all ages: League of Nations, Statistical Yearbook, 1937/38.

Costa Rica, Colombia, Indonesia, Czechoslovakia, and Poland.

Enrollment as percentage of population of all ages. Primary in 1936-38 and 1947-50 and post-primary in 1947-50 as percentages of population of all ages were taken from United Nations, Dept. of Social Affairs, Preliminary Report on the World Social Situation (New York, 1952), Appendix A. University students are included but are few (ibid., p. 69). The secondary enrollment percentage 1936-38 was estimated by multiplying the 1947-50 post-primary enrollment percentage by the ratio of 1936-38 to 1947-50 primary enrollment.

Population 5-19 as percentage of population of all ages. Costa Rica and Indonesia: 5-14 percentage averaged from ibid.; 15-19 percentage is the one given for Chile as of 1930 in League of Nations, Statistical Yearbook, 1937/38, p. 27. Colombia: 1918 percentage of 32.8 minus change 1920-30 in Chile (ibid.). Czechoslovakia and Poland: nearest date from ibid., 1942/44, pp. 31, 33.

Egypt, Mexico, and mainland China. Secondary enrollment for a nearby year from J.F. Abel, A Survey of a Decennium of Education in Countries Other than the U.S., U.S. Bureau of Education, "Bulletin," 1937, No. 2, Chap. 7, pp. 33, 54, 86. Primary enrollment and population 5-14: Unesco, World Survey of Education, II (1958), pp. 58-60. Population 15-19: Egypt and Mexico--interpolated using population 5-14 from League of Nations, Statistical Yearbook, 1942/44, pp. 25-26; mainland China--5-14's were multiplied by India's 1935 ratio of 15-19's to 5-14's, computed from ibid., 1937/38, p. 27.

Other countries: calculated from World Survey of Education, II, 58-60 and III (1961), pp. 80-81. Nigeria and Syria: primary schools only. Canada, Thailand, and N. Ireland: exclude teacher training. India: excludes Indian States. England and Wales, Scotland, Australia, and New Zealand: exclude vocational schools and teacher training. Sweden: excludes vocational and nonpublic primary schools.

1950-63

Unesco, *Statistical Yearbook, 1965*, Table 9. Costa Rica: 1963 figure includes evening schools. Colombia and Israel: include teacher training at third level. U.K.: 1950-60 for England and Wales exclude vocational and teacher training schools. France: 1950-55 exclude private vocational schools. Australia: includes preschool and special education, excludes private vocational schools. New Zealand: full-time students only.

1975-85

U.S., 1975 and 1985. Total enrollment and enrollment of 5- and 6-year-olds for these years were obtained from U.S. Census Bureau, "Revised Projections of School and College Enrollment in the United States to 1985," *Current Population Reports*, Series P-25, No. 365 (May 5, 1967), pp. 4 and 7, average of series B-1 and B-2. The ratio of kindergarten pupils to pupils 5 and 6 years old was obtained annually from *Statistical Abstract*, 1951-64 and 1966 issues, and its projections applied to remove kindergarten from the 1975 and 1985 Census figures. The resulting enrollment less kindergarten was divided by population 5-19 from U.S. Census Bureau, "Projections of the Population of the United States, by Age, Sex, and Color to 1990, with Extensions of Total Population to 2015," *Current Population Reports*, Series P-25, No. 359 (Feb. 20, 1967), p. 34 (series B). Similar enrollment ratios for 1950 and 1960 were computed from *Statistical Abstract*, 1952, 1961, and 1966 issues, and the ratio of Unesco enrollment ratios based on school age (*Statistical Yearbook, 1965*, Table 9) to them applied as a multiplier to the 1975 and 1985 ratios.

Colombia, 1976 and 1981. The ratios of enrollment to 5-19 year olds, from Bangnee A. Liu, *Estimating School Enrollment in Developing Countries*, "Population Studies," No. 40 (Sales No. 66. XIII.3; New York: United Nations, 1966), p. 60, were multiplied by the 1950-63 ratio of Unesco's enrollment ratio based on school age to their enrollment ratio based on years 5-19 (*Statistical Yearbook, 1965*, Table 9).

Philippines, 1975 and 1980. Calculated from Liu, *Estimating School Enrollment*, pp. 80 and 84. (Probably these forecasts are not consistent with 1950-63, being figured on a wider school age. For if from Liu, pp. 88-89, one calculates forecasts based on ages 5-19, the school-age based ratios are 1.37 times these instead of the 1.51 calculated from Unesco, *Statistical Yearbook, 1965*, Table 9, for 1950-63. One might think the way to get a consistent series is to apply 1.51 to Liu's ratios based on 5-19's. But this yields 96 and 106 which seem too high.)

2000

All forecasts read from the graphs.

II. ILLITERACY

A. INTRODUCTION

For each of the 31 countries of Table I, there appears on Table IV

1) the percentage of illiterates to population 15 and older, in the latest available year and as forecast by eye to the year 2000,

2) the letter of the chart, G or H, if either, that contains a curve for that country,

3) the name of the country, if any, of which a smoothed curve on Chart I was used in making the forecast,

4) any other information as to how the forecast was made.

The percentage of illiterates among persons 15 and older has ranged from 1.5 to 88 recently and is forecast to range from 1.0 to 65 in year 2000.

Table V shows the illiteracy rates of the same countries ranked from lowest to highest in 1963 and 2000. As with school enrollment, the most developed countries are toward the top and the least developed toward the bottom.*

The United Nations defines a person as literate if he can in some language "both read with understanding and write a short simple statement on his everyday life."** Those who can read but not write (semi-literates) are classed as illiterate.

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* Unesco, World Illiteracy in Mid-Century, Monographs on Fundamental Education, No. 11, 1957, p. 172.

** Ibid., p. 20.

TABLE IV

INDEX AND SUMMARY FOR ILLITERACY

	Population 15 and Older Illiterate, %					
	Latest Actual		Forecast to 2000		Country Used to Forecast Curve	Adjustment to Year 2000 Forecast
	Year	%	%	Chart		
U.S.	1959	2.3	1.5	None		
Africa						
Egypt	1960	80	53	G	India	
Nigeria	1950	88	65	H	India	See note 1
N.America						
Canada	1950	2.5	1.5	H		
Costa Rica	1963	16	7	G		See note 2
Mexico	1960	35	10	G	Arg.&Italy	
S.America						
Argentina	1960	9	4	G		
Brazil	1950	51	30	G		See note 3
Colombia	1951	38	25	H		
Asia						
Mainland China	1960	50	15	H		
India	1961	72	50	G		
Pakistan	1961	81	58	G		
Indonesia	1961	57	35	H		
Israel	1961	12	5	H		
Japan	1960	2.0	1.0	H		
Philippines	1960	28	9	H	Arg.&Italy	
Syria	1960	70	48	H		
Taiwan	1956	46	15	H		
Thailand	1960	32	10	G	Arg.&Italy	
Europe						
Czechoslovakia	1950	2.5	1.0	H		
France	1946	4	1.5	G		
E. Germany	1950	1.5	1.0	None		
W. Germany	1950	1.5	1.0	None		
Italy	1961	10	4	G		
Poland	1960	5	1.5	H		
Rumania	1956	11	1.5	G		
Sweden	1950	1.5	1.0	None		
U.S.S.R.	1959	5	1.5	G		
United Kingdom	1950	1.5	1.0	None		
Oceania						
Australia	1950	1.5	1.0	None		
New Zealand	1950	1.5	1.0	None		

NOTES:
1. Add 7 points.
2. Three points above Argentina & Italy
3. Five points above straight-line extrapolation.

SOURCES: Actual data: see Part A. Forecasts: see Charts G and H and text.

TABLE V

RANK COMPARISON OF ILLITERACY RATES, 1963 & 2000

	Population 15 and Over Illiterate, %		
	1963	2000	
E. Germany	1.4	1.0	E. Germany
W. Germany	1.4	1.0	W. Germany
Sweden	1.4	1.0	Sweden
United Kingdom	1.4	1.0	United Kingdom
Australia	1.4	1.0	Australia
New Zealand	1.4	1.0	New Zealand
Japan	2	1.0	Japan
Czechoslovakia	2.2	1.0	Czechoslovakia
United States	2.2	1.5	United States
Canada	2.3	1.5	Canada
France	3	1.5	France
Poland	3	1.5	Poland
U.S.S.R.	4	1.5	U.S.S.R.
Argentina	8	1.5	Romania
Italy	9	4	Argentina
Romania	10	4	Italy
Israel	12	5	Israel
Costa Rica	16	7	Costa Rica
Philippines	27	9	Philippines
Thailand	31	10	Thailand
Mexico	33	10	Mexico
Colombia	34	15	Taiwan
Taiwan	43	15	Mainland China
Mainland China	47	25	Colombia
Brazil	49	30	Brazil
Indonesia	57	35	Indonesia
Syria	69	48	Syria
India	71	50	India
Egypt	78	53	Egypt
Pakistan	79	58	Pakistan
Nigeria	81	65	Nigeria

SOURCE: Table IV and extrapolations from Charts G and H. Tied countries are arranged to minimize crossing over.

Data are generally based on the respondent's word, resulting in an understatement of illiteracy in the sources and so in this paper.* Tests administered in 1918 by the U.S. Army disclosed that 24 per cent of draftees were unable to read and write well enough to take the regular intelligence test. This figure was four times the corresponding rate of declared illiteracy in the 1920 census. Similar tests in the French army showed twice declared illiteracy.**

B. LITERACY AND EDUCATION

Literacy must depend largely on the proportion of people who have been to primary school. According to Unesco, "if less than 40 per cent of the children 5-14 are enrolled in primary school, the fight against illiteracy will not be won in the foreseeable future," while a fraction greater than 60 per cent is said to herald disappearance of illiteracy.*** Current literacy should depend little on current school enrollment or on secondary enrollment. This is illustrated by Table VI which compares school enrollment ratios with 1963 illiteracy rates. No close association of ranks is to be expected in the top third of the table because differences in illiteracy

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*The actual illiteracy rates in this paper are drawn from Unesco, Statistical Yearbook, 1963 and 1965; U.N., Demographic Yearbook, 1960; Unesco, World Illiteracy (cited above); Unesco, Basic Facts and Figures, 1959 and 1952; U.N., Report on the World Social Situation (1957). Rates were adjusted to refer to the population 15 and older in all cases.

**J.F. Abel and N.J. Bond, Literacy in the Several Countries of the World, U.S. Bureau of Education, Bulletin, 1929, No. 4, p. 3; World Illiteracy, p. 22.

***World Illiteracy, p. 165.

TABLE VI

RANK COMPARISON OF SCHOOL ENROLLMENT AND ILLITERACY RATES, 1963

	School Age Population in Primary and Secondary School, %	Population 15 and over Illiterate, %	
U.S.	100	1.4	U.K.
U.S.S.R.	97	1.4	Australia
France	94	1.4	New Zealand
U.K.	93	1.4	W. Germany
Australia	90	1.4	E. Germany
New Zealand	90	1.4	Sweden
Poland	90	2	Japan
Czechoslovakia	87	2.2	U.S.
Japan	86	2.2	Czechoslovakia
W. Germany	85	2.3	Canada
Costa Rica	84	3	France
Israel	83	3	Poland
Romania	82	4	U.S.S.R.
Canada	80	8	Argentina
Taiwan	79	9	Italy
E. Germany	78	10	Romania
Philippines	78	12	Israel
Sweden	77	16	Costa Rica
Argentina	73	27	Philippines
Mexico	68	31	Thailand
Italy	62	33	Mexico
Mainland China	61	34	Colombia
Colombia	60	43	Taiwan
Brazil	58	47	Mainland China
Thailand	55	49	Brazil
Syria	53	57	Indonesia
Egypt	48	69	Syria
Indonesia	44	71	India
India	39	78	Egypt
Pakistan	30	79	Pakistan
Nigeria	27	81	Nigeria

SOURCES: Tables II and V. Tied countries are arranged to minimize crossing over.

are slight. In the bottom fourth of the table there is the correspondence one would expect. In the middle of the table, however, there are large rank differences. France, Poland, U.S.S.R., Costa Rica, and Taiwan rank relatively high in enrollment but low in literacy. These countries may have older illiterates surviving from the days before primary education became widespread. East Germany, Sweden, Argentina, and Italy rank relatively low in enrollment but high in literacy. These countries may have had universal primary education for a long time without much stress on compulsory secondary education (research would be needed to establish this point). The crossing over in rank may thus reflect the lag of literacy behind enrollment and the inclusion of secondary school students.

Those with little or no primary school may learn to read and write in adult education courses. Literacy campaigns were encouraged by the governments of China, Turkey, and the U.S.S.R. after World War I. The "each one teach one" idea was applied in Brazil and Mexico. The Laubach brothers founded a world movement which since World War II has had "literacy houses" in India, Pakistan, Egypt, and elsewhere. National campaigns also were begun in Thailand, Indonesia, China, British Africa, India, and the Philippines during this period. "Operation Alphabet" in the U.S., consisting of a series of 100 half-hour television programs originated by the Philadelphia public schools, was promoted nationally by the National Association for Public School Education to teach a third grade reading and writing level, and a similar series was broadcast by the City of New York in 1965.*

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*W.S. Gray, "World literacy: its status and problems," National Society for the Study of Education, Yearbook, 1959, part 1, pp. 122-146. F.C. and R.S. Laubach, Each One Teach One, Syracuse University, 1960. R.A. Luke, "Operation Alphabet: Literacy through TV," International Journal for Adult and Youth Education, 1964, no. 1, p. 11-14. New York Times, March 5, 1965, p. 15.

However, status consciousness, conservatism, hostility among the rural populations to urban teachers, the reluctance of women to appear in public in some countries, and lack of time and energy on the part of adults all tend to limit the effectiveness of adult literacy drives, and many of those taught later backslide for lack of reading materials. In Unesco's experience, only 10 to 20 per cent of the illiterate population would enroll for literacy courses and up to half of these dropped out.*

Hence Unesco in 1964 switched over to a "functional literacy" program from which graduates would be unlikely to backslide. Teams have gone to Ecuador, Algeria, Iran, Pakistan, Mali and Tanzania to advise governments on literacy education in connection with economic development. Classes are set up after work for people 15-29 years old in regions where industry is already moving in. Reading, writing, civics, health, and technical and vocational subjects are taught in school buildings by regular teachers who earn extra money. The course lasts perhaps two years and costs the same per student per year as primary school.**

The effect of adult education on literacy is perhaps seen in the age breakdown for Brazil. For corresponding age groups in successive census, the percentage illiterate is shown in Table VII. People who in 1950 were

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*G. Hildreth, "World Literacy and Education," _School and Society_, Nov. 4, 1961, pp. 371-382. C.H. Madge, "Some Aspects of Mass Literacy," _British Journal of Educational Studies_, Nov. 1955, pp. 3-14. Mark Blaug, "Literacy and Economic Development," cited above.

**Mark Blaug, "Literacy and Economic Development" _School Review_, Winter 1966, pp. 393-418; Seth Spaulding, "The UNESCO World Literacy Program: a New Strategy that May Work," _Adult Education_, Winter 1966, pp. 70-84; _New York Times_, March 21, 1965, p. 20.

TABLE VII

POSSIBLE EFFECT OF ADULT EDUCATION IN BRAZIL, 1950-60

1950		1960		Improvement
Age	% Illiterate	Age	% Illiterate	% Points
10-14	56	20-24	33	23
15-19	47	25-29	35	12
20-24	46	30-39	38	9
25-29	48			
30-39	50	40-49	44	6
40-49	54	50-59	49	5
50-59	57	60+	56	4
60-69	61			
70+	67			

SOURCE: Unesco, *Statistical Yearbook, 1965*, p. 54; U.N., *Demographic Yearbook, 1960*.

20-49 years old improved their literacy rate 5 to 10 points in the following decade. (This compares with the 12 to 23 point improvement for those who in 1950 could have been of school age.

In the U.S., the Federal government has been paying to states 90 per cent of the cost of basic education for adults who did not finish eighth grade.* During fiscal 1965/66, more than 1/3 million participated. In the New York City program, stress has been on reading and writing but basic arithmetic and other subjects useful on the job have been taught. Regular

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*Under Title II-B, Adult Basic Education, of the Economic Opportunity Act, 1964. Title II-A, Community Action Programs, also provides some basic education. M.C. Neff, "Toward Literacy in the United States," *Wilson Library Bulletin*, June 1965, pp. 835 ff. J.R. Dorland, "Current Issues in Adult Education," *Adult Leadership*, April 1967, pp. 349-50, 381-82.

teachers, sometimes with special training, have met with students in schools, churches, empty stores, and union halls weekdays and weekends as mutually convenient. Recently Congress cut funds country-wide for such programs by 25 per cent.*

C. HISTORY

Independence and development-consciousness may bring a faster and faster decline in the illiteracy rate (India and Pakistan, in Chart G); then, with widespread primary education and the dying out of the older generations that missed school, the decline evens off (perhaps Argentina in Chart H); and finally, often with a decline in the relative importance of farm areas, where it is harder to keep children in school, illiteracy approaches asymptotically a 1 or 2 per cent minimum figure (France, U.S.S.R., and many other developed countries).

One might think all one-party socialist countries would have steeply sloping curves, since for indoctrination and for economic development their governments would be anxious that everyone should read. However, Indonesia and U.S.S.R., both in the past, provide the only examples. Romania might seem to be another but its curve was steep also under capitalism (perhaps because of oil exploitation--research would be needed here). A literacy curve for Japan, were it available, would surely be as steep till recently as Romania's. And in two other one-party socialist countries illiteracy rates are unchanged in 13 years (Egypt) or down only 2 points in 10 years (mainland China). It is interesting that a comparison of Egypt's 1947 and 1960 censuses shows hardly any change in literacy rates broken down by age

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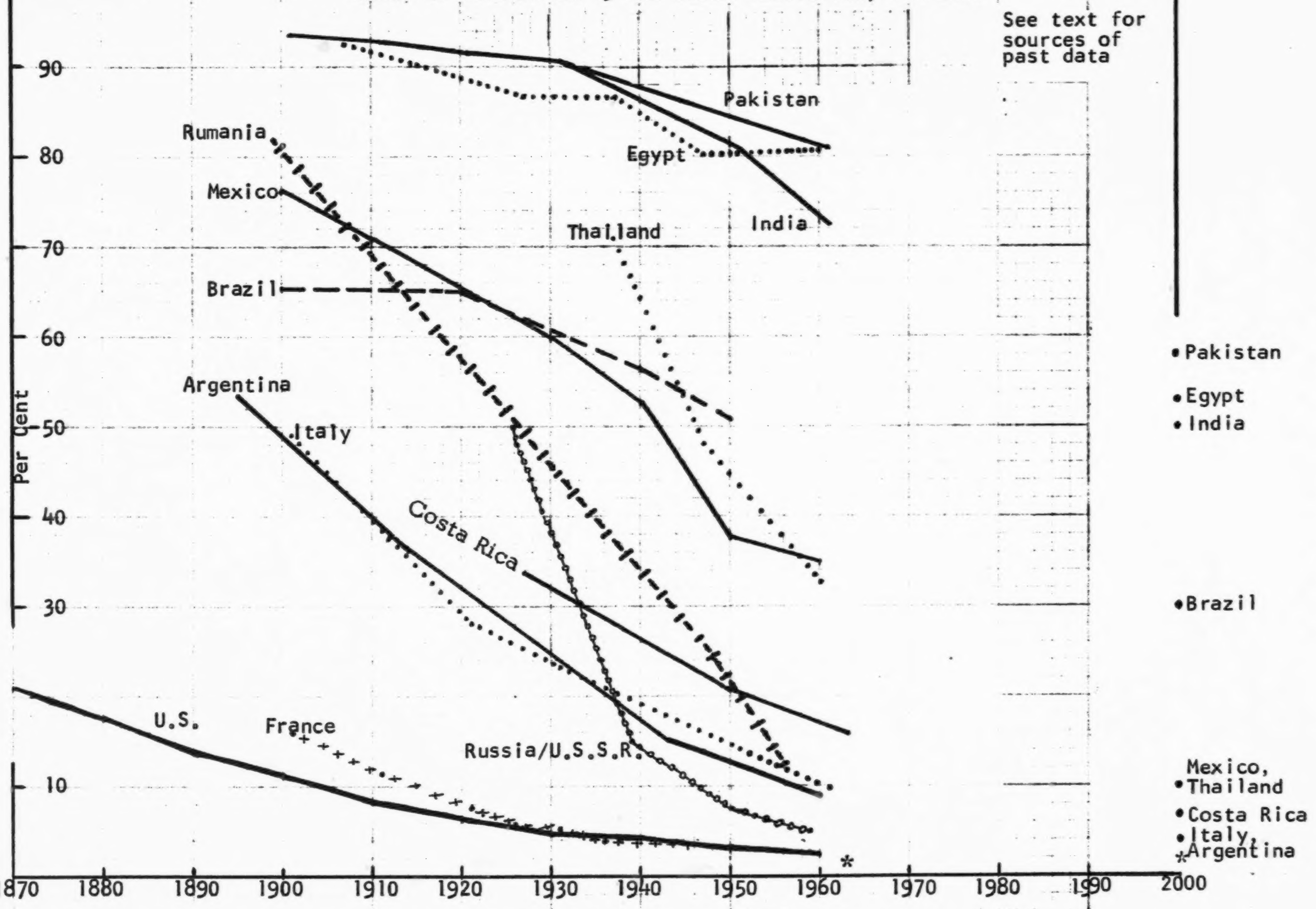
*New York Times, December 19, 1966, 1:6.

CHART G. POPULATION 15 AND OLDER ILLITERATE, PER CENT

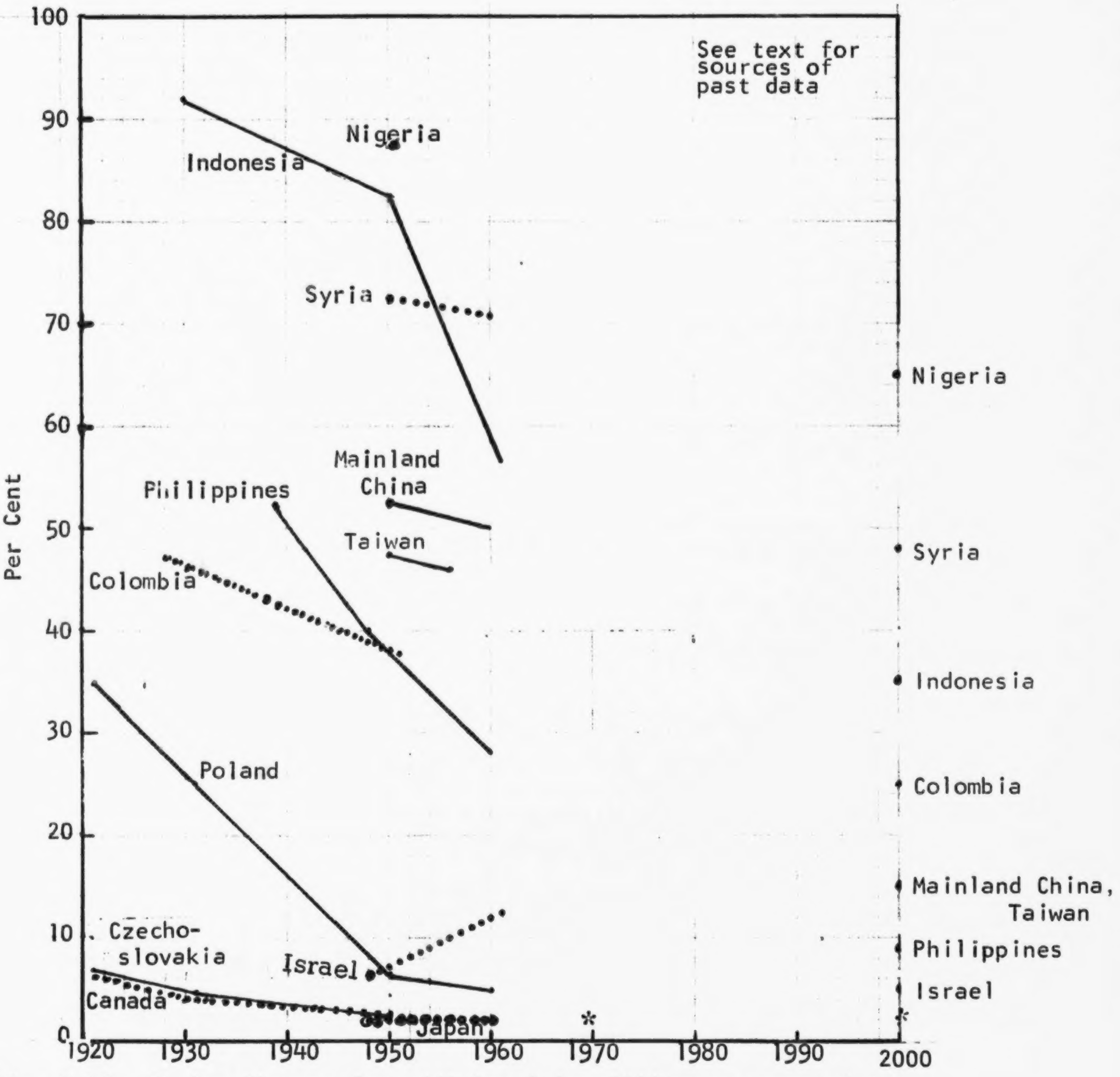


See text for sources of past data

*See Table IV for figures for additional low-illiteracy countries.

CHART H

POPULATION 15 AND OLDER ILLITERATE, PER CENT



*See Table IV for figures for additional low-illiteracy countries.

except for an improvement from 64 to 60 per cent illiteracy among 10-14 year olds, the most literate group in the Egyptian population.* Apparently one-party socialist states have paid less attention to literacy than the example of the U.S.S.R. would lead one to expect.

Israel is unique among the 31 countries in that its illiteracy rate worsened; apparently illiterates immigrated from Yemen, Morocco, and other Arab lands.

D. FORECASTS

The most logical way to forecast illiteracy would be from school enrollment. Suppose that 40 per cent of a country's population is under 15, 40 per cent 15-44, 15 per cent 45-64, and 5 per cent 65 and older, and that this age distribution will continue. Suppose no one can read or write now but that beginning tomorrow everyone just turned 15 has finished primary school and is literate. Then 25 years from now all the 15 to 44 year olds, or 70 per cent of the population 15 and older, will be literate, and 45 years from now all the 15 to 64's or 92 per cent of the population 15 and older. However, such methods would be time-consuming except as a check.

The forecasts on Table IV were made a number of different ways:

1. A country was simply assigned a figure for the year 2000 without reference to any curve (U.S., U.K., France, and others).
2. Its curve was projected to the year 2000 free-hand (India, Italy, Argentina).
3. The country was assigned a figure for the year 2000 that would be different from another country's by a given number of points because the countries had run parallel in the past (Costa Rica).
4. The country's curve was projected to the year 2000 to follow another country's experience as shown by a smoothed curve on Chart I; some given number of points might be added or subtracted (Egypt).

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*Unesco, Statistical Yearbook, 1965, p. 50.

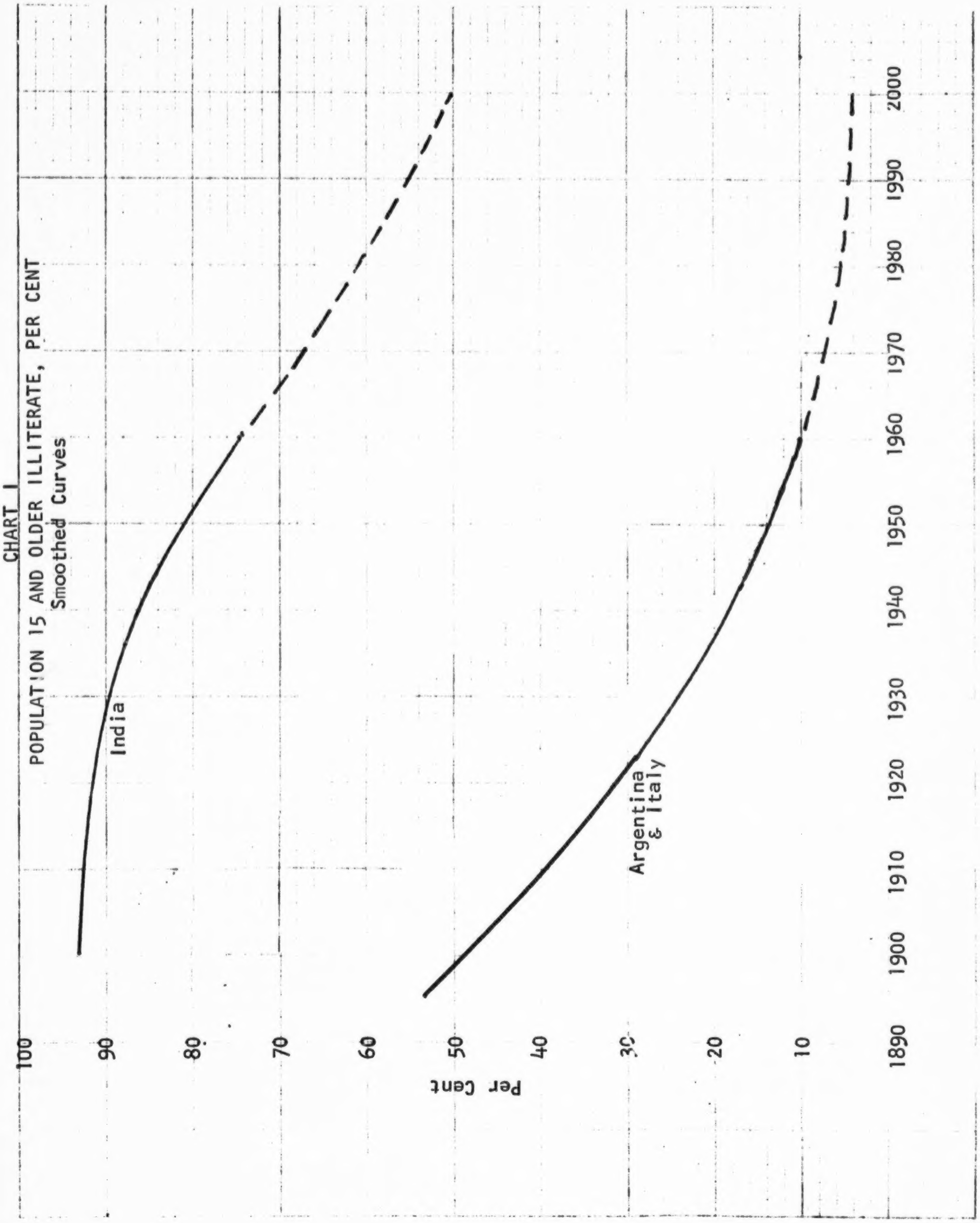

CHART I

POPULATION 15 AND OLDER ILLITERATE, PER CENT

Smoothed Curves

10 X 10 TO 1/2 INCH 46 0622
KEUFFEL & ESSER CO.

The purpose in all cases was to keep the forecasts in line with what appeared reasonable from past school enrollment and past and present literacy.

According to Unesco, 1 to 2 per cent illiteracy due to subnormal intelligence or physical handicap is probably an irreducible minimum for any population.* But for 1959 the U.S. Census Bureau showed 0.5 per cent illiteracy among 14-24 year old whites. (Non-white illiteracy ranged from 6.1 per cent among 35-44 year olds down to 1.2 per cent among 14-24 year olds.)** Hence the rates for some countries that have had high enrollment ratios, have high per capita income, are racially or linguistically homogeneous, or seem to be working for fast economic development, are forecast to fall as low as one per cent.

The forecasts show Egypt, Nigeria, and Pakistan as the only countries with over 50 per cent illiteracy in the year 2000.*** The ranks as forecast are almost identical with 1963 ranks (Table V).

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*World Illiteracy, p. 36.

**Statistical Abstract of the United States, 1963, p. 123.

***The inexactness of these forecasts is illustrated by the changes in the original forecasts resulting from the publication of 1960 data for 10 countries since the April 1966 version of this paper. Of the 10, Pakistan's forecast was unchanged; three countries were changed 1 or 2 points; Nigeria, Egypt, Syria, mainland China, and Taiwan 5 to 9 points; and Indonesia 13 points. A way to improve the forecasts, by taking advantage of the fact that literacy for persons who will be over 50 in year 2000 is to a large extent known already, was pointed out in the introduction to this section.

III. U.S. GRADUATES[*]

We turn now from projections of illiteracy to projections of U.S. educational achievement. Chart I shows annual high school graduates as a percentage of persons 17 years old and annual college graduates as a percentage of persons 21 years old.

High school figures are based on U.S. government projections.[**] The projections begin as a straight line but are assumed to level off at around 80 per cent. The leveling off is based on the assumption that a person with an effective intelligence of 90 on I.Q. scales (without implying a fixed or nativistic view of attained I.Q.) can complete eight grades with some retardation and can even finish high school with persistent effort. Twenty-four per cent of the population falls below this level. If we assume (1) that most people with an I.Q. of 90 or less will not have sufficient pertinacity to graduate and that those that do will be balanced by a few particularly sedulous students with lower intelligence, and, (2) that attained I.Q. and level of educational standards will advance at about the same rate, we arrive at a constant figure of 24 per cent of the population that is unlikely to graduate from high school. Because approximately 8 per cent of the high school age population is enrolled in vocational schools requiring lower attained intelligence (on I.Q. tests), we assume the 80 per cent represents a probable ceiling on high school graduation.

A tapering off of the high school graduate line around 1980 at the 80 per cent point would probably become significant for the educational attainment of the entire population around 1990. In the year 2000, somewhat less than 75 per cent of the adult population might be high school graduates.

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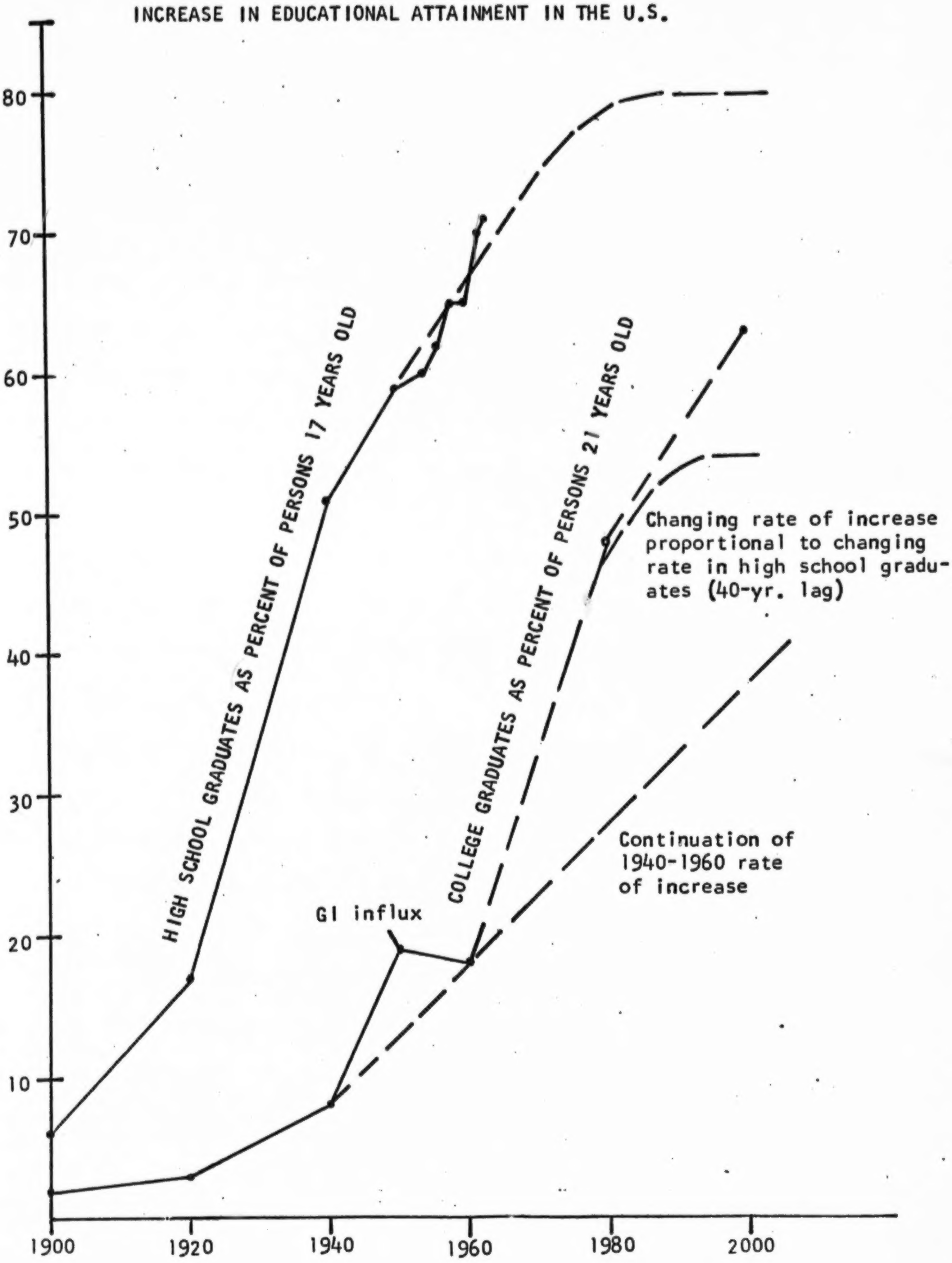
[*] This section was prepared by Laurie C. Rockett.

[**] U.S. Dept. of Commerce, Bureau of the Census. Statistical Abstract of the United States, 1965, Washington, D.C., 1965, p. 128.

CHART J

INCREASE IN EDUCATIONAL ATTAINMENT IN THE U.S.



Figures for college graduates are actual up to 1960.[*] Percentages are projected to 1980 on a straight line parallel to high school graduates of 40 years earlier, and then tapered off at 54 per cent. This seemed reasonable because the slope of the high school line from 1900 to 1920 was nearly the same as the slope of the college line from 1940 to 1960. The tapering off assumes that an I.Q. of at least 100 is needed to complete college. This point was derived from the high school senior mean I.Q. of 107 and the assumption that a higher I.Q. is necessary to do acceptable work at a good college.[**]

We have distinguished attained I.Q. from any implication of latent or fixed natural endowment. Studies of identical twins[***] that have been separated from infancy have demonstrated that extreme differences in environment, particularly in educational environment (not defined) can result in I.Q. differences of up to 20 points. This is the difference between a good student at one of the best colleges and a below-average high school senior, or between a moron and someone who can hope to finish high school. It might be interesting to relate this kind of data to the "poverty culture," and ultimately to the possible effects of changes in the numbers in poverty and the percentage of high school and college graduates.[****]

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[*] Ibid., pp. 128 and 24.

[**] Ernest R. Hilgard, Introduction to Psychology, Harcourt, Brace and Company, New York, 1953, p. 399.

[***] Benjamin S. Bloom, Stability and Change in Human Characteristics, John Wiley and Sons, Inc., New York, 1964, p. 118.

[****] This subject is touched on in "The Future of American Poverty: Some Basic Issues in Evaluating Alternative Anti-Poverty Measures," HI-1006-RR (April 15, 1968), prepared for the Office of Economic Opportunity.

HI-1043-RR

PART SIX

A ROLE FOR HIGHER EDUCATION IN POST-INDUSTRIAL SOCIETY

By

Richard Brown

TABLE OF CONTENTS

Page

INTRODUCTION. 6-1

THE FORCES AT WORK. 6-1

SOME IMPLICATIONS FOR HIGHER LEARNING 6-17

A Role for Higher Education. 6-17

Why Save the Humanities? 6-25

Future Contexts for Curricula. 6-36

Some Comments on Teaching. 6-46

Some Institutional Alternatives. 6-53

INTRODUCTION

In one currently postulated alternative future--the post-industrial or post-economic society--the habits and instincts of competition and survival would become obsolete. Man would not have to work for his sustenance; his social organization and technology would provide it for him. This world could be a veritable Garden of Eden; or it could be a "No Exit world" without purpose, tormented in the confrontation with itself.

This alternative world of economic progress and relative stability will be assumed to have prevailed in the paper that follows. On that assumption, I will try to outline what seem to me to be the important forces at work in our society and their implications for higher education in the decades ahead.

THE FORCES AT WORK

The merchants huddled at the castle gates did not know they spearheaded a movement which was to transform the feudal system. And science and technology are likely to be a force of equal power, one which will create its own elites and institutions and supplant the capitalist system and values which dominate our society today.

There is considerable reason to believe this may be the case. There is, for example, the familiar but still startling calculation that of all the scientists who ever lived more than half are alive today and the well-documented "exponential growth" of scientific knowledge.* More important, perhaps, is that the lead time from scientific discovery to technical-commercial application has shrunk exponentially. Francis Bacon lauded the invention of "gunpowder, the compass, and the printing press" and said the aim of science was "to extend more widely the limits of the power and greatness of man."* But the union of science, technology, and industry awaited the rise, in the nineteenth and twentieth centuries, of a class of entrepreneurs and scientifically trained engineers who could translate the "Laws of Nature" into useful commercial devices.** In the twentieth century the flow of scientific knowledge into industry has grown from a stream to a river--which smashed the dikes in World War Two. Thus, a 1937 study predicting new inventions totally missed, not only the computer, but atomic energy, antibiotics, radar, and jet propulsion. An investigation by Frank Lynn of twenty major technological innovations since 1900 shows how every step in the process of technological development and diffusion has accelerated during this period: The average time-span between the initial discovery of a technological innovation and the recognition of its commercial potential decreased from 30 years between 1880 and 1919, to 16 years between the World Wars, to 9 years in the postwar period. In other words, measured by economic growth, the rate of diffusion of technological innovations introduced during the postwar period was about twice the rate for post-World War I innovations and four times the rate for innovations introduced during the early part of this century. And the systematic application of science and technology to the processes of production has effected transformations in society probably unprecedented since the neolithic revolution of 6,000 B.C.

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*This term was popularized by Derek Price; see Science Since Babylon (New Haven: Yale University Press, 1961).

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*F. Bacon, On the Advancement of Learning, 1605.

**Blast furnaces were in use for more than two hundred years before anyone understood the chemical processes that went on in them. Watt invented the steam engine over fifty years before the law of thermodynamics was formulated.

Nevertheless, the mechanical phase of the industrial revolution in the eighteenth and nineteenth centuries may seem like child's play in light of the automated phase of industrialism, or post-industrialism, which is coming upon us now. The first stage of industrialism replaced human muscle with mechanical power and the craft work of hand and eye with rigid mechanical precision. In the electronic phase of industrialism, computers will take over the formerly human task of directing the machines. Ideally, and already in some industries in fact, a manager may come to his factory in the morning, program its work for the day, and leave the machinery to work unattended while he handles correspondence and contemplates trends of the future.*

Lewis Mumford and others have pointed out that the indirect impact of technics on social norms and patterns can be immeasurably greater than the impact of their immediate content. But because of their directly demonstrable operational efficiency--greater output at less cost--technological innovations tend to diffuse rapidly, and their immediate utility seems to obviate consideration of their long-range (and possibly undesired) social consequences. The inventors of the trolley cars did not realize they had spawned the suburbs; Mr. Otis did not know his elevators would change the structure of urban life.

To these well-known "side-effects" of technological progress the electronic age is about to add another of much greater magnitude--the obsolescence of human labor. But this, however, is not without precedent. Toynbee provides us with numerous examples of the interplay of technology and social structure. Under Solon, the Greeks moved from mixed farming to specialized production for export, resulting in rising incomes and a tremendous release of cultural creativity. With the growth and conquests of the Greek commercial empire, the next phase of this specialized production came to depend on the labor of family slaves, with another spectacular rise in output. But thereafter the Romans, their armies of technically specialized slaves working the land, blighted the social existence of the independent farmers and entrepreneurs and glutted the cities with rootless and despondent parasites.

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*G. Thomson, The Foreseeable Future (New York: The Viking Press, 1960), p. 139.

These three phases might be compared to the revolution in commercial capitalism that gave birth to the Renaissance, the Industrial Revolution, with greater division and mechanical multiplication of labor, and the electronic revolution of today. As Norbert Wiener pointed out,

> Let us remember that the automatic machine, whatever we think of any feelings it may have or not have, is the precise equivalent of slave labor. Any labor which competes with slave labor must accept the economic conditions of slave labor. It is perfectly clear that this will produce an unemployment situation, in comparison with which the present recession and even the depression of the thirties will seem a pleasant joke.*

While Wiener was chiefly worried about economic consequences, other writers have been concerned about the psychological dangers of almost total leisure. "Assuming no important wars and no important increase in population," wrote John Maynard Keynes,

> ...the economic problem may be solved, or be at least within sight of solution, within a hundred years. This means that the economic problem is not--if we look into the future--the permanent problem of the human race...
>
> Will this be a benefit? If one believes at all in the real values of life, the prospect at least opens up the possibility of benefit. Yet I think with dread of the readjustment of the habits and instincts of the ordinary man, bred

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*N. Wiener, The Human Use of Human Beings (Avon Books, 1967), Ch. IX.

> into him for countless generations, which he may be asked to discard within a few decades. To use the language of today, must we not expect a general "nervous breakdown"?*

Paul Goodman criticizes the lack of "socially useful" labor in our society. But labor is becoming increasingly unnecessary--even if we embark simultaneously on a war on poverty, a crusade for development, an accelerated space effort, or other socio-economic equivalents of war, or of cathedral building. Just as Moses held his people in the wilderness until a new generation was ready for the Promised Land, so we seem unconsciously to have imposed a moratorium on leisure until our values and institutions are ready to accommodate it. "Compulsory work is on the way out," writes Denis Gabor, "but compulsive work will have to stay with us until a new generation grows up for which there will be no sharp limit between work and play."** In all ages past, the great majority of people had to work to support a leisured minority. In the decades ahead, a small minority may work to support a leisured majority. According to the acquisitive gospel of work, this majority will be economically redundant and socially useless. Without a transvaluation of values and the introduction of more appropriate social controls, the advent of mass leisure may portend spiritual and social collapse.

But could such a powerful and viable system as capitalism give way to a new social order? To most this seems unlikely. The many visions of the future in America, from Fourth of July speeches to the sanctums of policy councils, rarely foresee fundamental change in our social order; they view America's future in terms of more of what we have now, with the structure of labor, management, and the marketplace relatively intact. But major historical trends tend almost by definition to be imperceptible, to lie in the accumulation of innumerable individual acts which have qualitative aggregate consequences unsuspected by the particular actors.

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*J.M. Keynes, "Economic Possibilities for Our Grandchildren" (1930), in Essays in Persuasion (New York: W.W. Norton, 1963), pp. 365-6.

**D. Gabor, Inventing the Future (New York: A. Knopf, 1964), p. 119.

The immediate instrumental utility of cash exchanges attracted feudal elites, for example, but by drawing more men into the cash nexus, capitalism ultimately weakened the bonds of personal loyalty upon which the feudal system was based. The marketplace destroyed as it seduced. In his essay on "The Future of Capitalism," Robert Heilbroner finds a similar force in the science and technology of the modern world:

> Could there be in our day an equivalent of that powerfully disintegrative and yet constitutive force--a force sufficiently overwhelming to render impotent the citadel of capitalism, and yet as irresistibly attractive to it as the earlier current of change was to feudalism? I think there is such a force, and that it already bulks very large within our world. This revolutionary power is the veritable explosion of organized knowledge, and its applied counterpart, scientific technology.*

The direct effect of technology, Heilbroner explains, lies in the immediate change in the environment brought about by the application of the new techniques, such as more efficient production through computer controls or greater ease of movement through jet transport. But there are also the indirect effects, which diffuse slowly through society, as the secondary consequences of the new machinery or processes. Canals linking the Great Lakes caused a plethoric invasion of lampreys which killed off traditional fishing industries; strip-mining in Appalachia has made even dirt farming impossible; automation brings labor displacement or unemployment. Against this tremendous onslaught of technology, continues Heilbroner,

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*Commentary, Vol. 41, No. 4, April 1966, p. 28.

> ...a market economy offers but one instrument of control--the profit or loss stemming from the direct effect of a particular technology. As to its side effects, the market mechanism proper has no controls whatsoever. As a result, the invasion of technology becomes an essentially disruptive force, continuously upsetting the patterns of life in a haphazard manner. Under a system that abdicates as much decision-making as possible to the rule of profit, the possibilities for a rational restraint over this force that rearranges our lives thus shrinks to a minimum.*

Thus capitalism finds itself in dialectical opposition to its own inner dynamic. Of all the limits to which our present system is subject, this seems the most unyielding. For as the corporate system grows ever more powerful and productive, the social consequences of its technology increasingly call for non-market governance.

In the economic arena itself, governmental adjustments have been accepted as necessary to smoothe out cyclical depressions. Such actions are taken not to transform capitalism but to preserve it. Yet the cumulative effect of such policies increasingly has been the creation of a federal establishment and a class of managers and technicians which has no vested interest in the maintenance of the capitalist system as such and which, indeed, may eventually come to steal its power.

In the area of military and international affairs, too, quantitative innovations have resulted in qualitative structural changes. The possibility of nuclear extinction not only poses a threat to our future; it also changes the objective reality of the present. Since even "victory" in a nuclear exchange would mean tremendous loss in life and property, and probably unmendable rendings in social and political institutions as we know them, the imperative of military policy has been to avoid pushing enemies (or ourselves) into desperate situations where the use of atomic hardware becomes "necessary." Our coexistence with competing nuclear powers is not so much a matter of humane choice as a condition imposed on us by technological realities.

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*Ibid.

At the same time, however, in order not to be intimidated by our opponents' nuclear capacity, we feel we must maintain our own, though disclaiming any wish to use it. But just because we do not wish to use our nuclear capacity, we feel compelled to build up a panoply of other military capabilities so as to have a full range and choice of response. The result has been the institutionalization of the military-industrial-political web of interests and enterprises needed to support this massive destructive potential. This "complex" today contributes between eight to ten per cent of the GNP, employs some 4.3 million workers, and absorbs ninety per cent of research financed by the federal government. And perhaps more important, the semi-militarization of the American economy has come to be accepted as normal and permanent by virtually all sectors of society, including the academic.

The technology on which our national economy is based has also created a national culture--the "implosion" of the electronic age. Americans are exposed to news gathered by the same national wire services and read the same weekly magazines, published simultaneously in different parts of the country. An estimated 85 per cent of the television audience of the nation collectively mourned the death of President Kennedy. Even a shaper of popular styles such as Johnny Carson reaches some 20 million "between-the-toes" viewers nightly.

This affects people's standards of judgment. National social norms emerge. "Selma" became a nation-wide symbol of moral outrage. Likewise, Northern wealth and relative opportunity, now visible to Southern poor and Negroes, is creating a new sense of "relative deprivation" in terms of a new "reference group"--the national society at large. And the federal government is acquiring growing awareness of the importance of anticipating and directing emergent social needs and change.

An even greater social effect of new technology, which could overshadow all others, is, as noted earlier, that it may render human labor redundant. The creation of new jobs in the public service sector has largely accommodated automation so far. Between 1950 and 1960, nine out of every ten new jobs were in the not-for-profit sector.* But with the invasion of automation into clerical, administrative, and service occupations it is possible that, just as five per cent of the population feeds the rest of us, by the year 2000 another five per cent will be able to clothe, house and provide with essential goods and services the remainder of the population.

As Kahn and Wiener have pointed out, the average work year has dropped from about 3000 hours in 1900 to 2000 hours in 1966, and could be reduced again by one-third, or more, even while substantial economic growth continues.** As their analysis indicates, problems of alienation from the economic and political system are likely to be exacerbated as a result.***

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*Ginzberg, Hiestand and Reubens, The Pluralist Economy (New York: McGraw-Hill, 1965).

**H. Kahn and A.J. Wiener, The Year 2000: A Framework for Speculation on the Next Thirty-Three Years (New York: The Macmillan Company, 1967), pp. 123-127, 167-184.

***Ibid., pp. 193-211.

I would add that with basic needs being easily satisfied, and with an ever higher proportion of the population not working or working in the non-profit sector, there will have been created a huge new group which has no vested interest in the maintenance of the capitalist marketplace. As acquisitive drives and values become less a stimulus for sacrifice and self-discipline, the state may have to assume a new role both in allocating pleasures and in recruiting men for demanding but essential posts which may lack applicants.*

The central purport of all these trends is that we can expect to see increasingly a passing of policy-making power from the commercial sector to the not-for-profit sector, and from the legislative branches of government at all levels to the executive. The increased interdependency of the national economy, the greater component of technical planning in social decisions, and the new role of war technology and international affairs, all are giving rise to an overwhelming need not for free enterprise or the laying down of law, but for the planning and executing of comprehensive long-range national social, economic, and security policies. This new function of executive government, rather than the traditional functions of the commercial sector, will be a central determining force of the post-industrial age.**

We can see the educational and social preparation for this phenomenon taking place already. As automated systems become increasingly complex, even highly skilled occupations either become obsolete or demand more and more theoretical knowledge. Fifty years ago, for example, the engineer learned applied science, which was the pure science of the previous generation, and then applied his knowledge during another generation. Though his practical experience increased, his theoretical base generally did not. But today new inventions and systems, at any rate in the more advanced industries, increasingly are created not by engineers but by physicists, who often develop them up to the stage of manufacture and then turn them over to production managers.*

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*On the problem of establishing new non-market controls, Daniel Bell has outlined a "System of Social Accounts." See his "Notes on the Post-Industrial Society, II," The Public Interest, No. 7, Spring 1967, p. 102.

**For evidence of a historical trend in government in this direction see James MacGregor Burns, Presidential Government, the Crucible of Leadership (Boston: Houghton Mifflin, 1965), pp. 80-88.

Thus the systematic application of organized knowledge has come full circle and is now transforming our conception of the nature and function of knowledge itself. As the pioneer microbiologist René Dubos puts it:

> In a world where everything changes rapidly, the practical facts learned in school become obsolete....The only knowledge of permanent value is theoretical knowledge; and the broader it is, the greater the chances that it will prove useful in practice because it will be applicable to a wide range of conditions. The persons most likely to become creative and to act as leaders are not those who enter life with the largest amount of detailed specialized

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*This reorientation from the directly practical to the general and theoretical has been accelerated by war. James Conant tells the story of a representative of the American Chemical Society who called on Newton Baker, Secretary of War at the outbreak of World War I. When the chemist offered the services of his Society to the government, he was thanked and informed that the offer was unnecessary, as the War Department already had a chemist on its staff. The Allies, meanwhile, had anticipated a short war, assuming that their naval blockade would cut the Central powers off from their supply of Chilean nitrates, without which explosives could not be made. But under the pressure of isolation, "Germany harnessed all her available scientific energy and resources to solving this problem. The result--the development of synthetic ammonia by Bosch and Haber--was a turning point, not only in Germany's capacity for waging war, but also in the connection of science and technology." See J.B. Conant, Modern Science and Modern Man. This story is cited by D. Bell, "Notes on the Post-Industrial Society, I," The Public Interest, Number 6, 1967, p. 29.

> information, but rather those who have enough theoretical knowledge, critical judgment, and the discipline of learning to adapt rapidly to the new situations and problems which constantly arise in the modern world.*

As economic and social processes become more complex through the application of modern technology, theoretical knowledge emerged as the new "property," and must be considered a factor in production as much as--and perhaps more than--land, labor, and capital. The assembly line has given way to the magnetic tape, and the human intellectual processes have again come to the center of the socio-economic stage.**

With this change has come a shift in the arena of status competition. For the managerial revolution does not represent a "take-over" of the corporations by the technocrats, but rather the emergence of new, non-propertied elites and thus the transfer of status competition from entrepreneurial capitalism to education and applied theoretical knowledge, from the marketplace to the university and the bureaucracy.

The new elites provide an indispensable planning and administrative mechanism for more traditional political office holders and the corporate upper class. Although socially similar to the old Progressives in many ways, the new elite differs from earlier intellectual groups in assuming big organization as the natural order of things. "Competition" for the new class does not mean individual entrepreneurship in the "free market," but rather the exercise of educational advantage within a large bureaucracy. (In this connection, one may note that many Brain Trusters of the New Deal--the first national crystallization of the technical intelligentsia--later used that experience to go over to the big interests which they previously opposed.) "Magic mobility," the phrase by which Europeans denote the easy transfer in America of theoretical and administrative skills among university, corporation, and government, is another sign of the amalgamation of the elements of the new class with each other and with currently dominant ruling groups.

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*R. Dubos, Man Adapting (New Haven: Yale University Press, 1965).

**This shift from practical to theoretical knowledge already is visible in the nation's job structure. In this respect, 1956 was the first year in American history, if not the history of industrial societies, in which the white-collar workers outnumbered the blue. The transformation of America's occupational structure, and therefore its class structure, also is revealed in figures on the growth in professional and technical employment. In 1940, there were 3.9 million professionals and technicians in America, making up 7.5% of the labor force; by 1962, the number had risen to 8 million, comprising 11.8% of the labor force; by 1975 about 15% of the labor force are expected to be technicians and professionals.

We should not expect the new class to become a new upper class or a new ruling class.* To plan policy and to administrate a bureaucracy is not to rule. Final or predominant authority over the major policies of a system does not follow automatically from the fact that one's function is necessary to the system. Rather, what is more likely to occur is an opening of upper-class ranks to selected top executives and super-managers, Robert McNamara, for example, being a prototype. Moreover, the upper class itself is taking full advantage of privilege in the field of education. Domhoff's recent study shows that

> ...Private school graduates go to the finest universities in the country, universities which are the major suppliers of American expertise. Our study of the 1965 *Social Register Locater* showed that 8 percent of a sample of 182 adult males

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*Similarly, "the rising middle class" in England never became a ruling or even an upper class. Many merchants did enter the ranks of the gentry *individually*, after having made appropriate kow-tows and renouncing their merchant status. See J.H. Hexter, "The Myth of the Middle Class in Tudor England," *Reappraisals in History* (New York: Harper, 1961), pp. 71-116.

> have the title "doctor" before their names. Whether the degree is medical or academic, this percentage suggests a considerable amount of expertise within the upper class.*

Nonetheless, as the professional and technical sectors of society expand, the interests of this stratum, of this new constituency, will exert greater pressure and autonomy. In the world of automation and leisure of the year 2000, it is not impossible to imagine a society whose central purpose and raison d'être would be scientific discovery itself. The capitalists and industrialists who have dominated our society for the last hundred years would have given way to new men--the scientists, mathematicians, and social planners of the electronic age. The most dynamic, innovative and powerful institutions would not be the corporate enterprises, but research agencies, experimental laboratories, computer centers, and the universities; the highest social status and personal goal would be that of the Chinese scholar who passed his Mandarin examination at seventy-five: the attainment of a thorough and universal scientific understanding of the workings of the world.

Traditionally, the American business aristocracy has exerted a profound influence on the university system through financial support in the form of personal gifts, foundation or corporate grants, family endowments, or direct service on the board of trustees.** As might be expected, the corporations tend to stress technical and practical training as opposed to traditional, classical education. Thus, Joseph Wharton gave the University of Pennsylvania $600,000 to found the Wharton School of Business and

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*W. Domhoff, Who Rules America? (New York: Prentice-Hall, 1967), p. 149.

**Curti and Nash present elaborate data to support this point and stress that the gifts of the corporate rich create model universities and set standards of tone and quality which state-supported universities later follow. See M. Curti and R. Nash, Philanthropy in the Shaping of American Higher Education (New Brunswick, N.J.: Rutgers University Press, 1965).

Finance and George Eastman between 1912 and 1920 gave $20 million to M.I.T. The board of the University of Rochester is composed of officers of such Rochester-based firms as Eastman-Kodak, Xerox, and Taylor Instrument. The chairman of the board, who is also president of Xerox, explained the relationship as follows:

> To put it as crassly as possible, it's a matter of sheer self-interest--dollars and cents. Xerox will live or die by technology.*

Domhoff's study in 1967 of the interlocking of corporations, corporation-controlled foundations, and elite universities indicates that corporate influence on the university system has not diminished.** However, the relationship can be expected to change and grow more complex, largely due to the changing nature of technological research and the new role of the federal government.

Technological innovation is the discovery and application of more effective ways of doing things, and until recent times it has not been concerned with the systematic accumulation of knowledge or theory per se. But it has become increasingly apparent that pure research rather than applied has the greater innovating impact. In the words of management consultant Peter Drucker, "pure research has simply become the most effective form of applied research."* Because of this, the proportional increase of expenditure on pure science is much greater than on applied research. Although much of this R&D is contracted to private industry, the greatest part falls to graduate departments of America's leading universities, which in turn, as we will discuss later, have come to dominate higher education. This has been an adequate arrangement from the viewpoint of the corporations, considering the high costs and high risks of pure research, as well as the public, and therefore unpatentable, nature of discoveries in this field.

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*Forbes, October 1, 1965, p. 37. The interest of the corporate elite in the universities also is related to the non-economic fact that private schools and elite universities have long been a social training ground for members of the national upper class (despite the top universities having opened their portals to the sons of middle- and even lower-class families).

**W. Domhoff, op. cit.

Thus the Veblenian fear that "higher learning" was becoming a business enterprise, dominated by businessmen and business values, increasingly must be modified. For the universities have a new paymaster, the government, and particularly the military. This means that increasingly in the decades ahead the influence on university education of the corporate upper class will not be direct, but will be tempered, modified, and exerted through various agencies of the federal establishment. More importantly, it means that there will be much greater competition for academic resources generally and thus increasing bargaining strength and potential independence for the academics.

As the new society comes more and more to depend on theoretical knowledge, the university, as the place where this knowledge is sought, tested, and codified, could, as we have suggested, become the central institution in society, drawing the best talents and generating the most powerful innovations. Whereas formerly its chief function was to preserve the values and traditions developed in the society at large, in the new society it may be the transformer of values and a maker of tradition. And instead of merely reflecting the status system of the broader society, the universities may be the source and arbiters of economic position and social prestige.

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*P.F. Drucker, Landmarks of Tomorrow (New York: Harper & Row, 1965), p. 25.

SOME IMPLICATIONS FOR HIGHER LEARNING

A Role for Higher Education

I have tried in the previous section to evoke a sense of the great new power which lies in emergent technology, and to locate some of the points of its direct impact, while noting that the indirect effects of the new technology are less obvious but no less pervasive.

It will undoubtedly bring a change in values; the danger is a deterioration of all values. Rome, as we have seen in Toynbee's example, is perhaps the most dramatic illustration of how technological changes can cause a transformation of values and lead to the collapse of the state.* And the transformation of values in Nazi Germany, for example, reveals how value changes can be a vehicle for national cohesion and Realpolitik.

Our interest in values here, however, is not in their utility to the power of the state, but rather in how the state can serve values. From this perspective, one aspect of the value changes in Germany is of particular interest. Herman Kahn has noted wryly that a "professional" is "a man who doesn't care where he is going, so long as he gets there competently." In the early phase of industrialism, with functional specialization and division of labor the keynote, such an attitude was understandable if dangerous. But in our electronic era of interfunctional integration, this fragmented view of the world is obsolete and, with the Faustian powers (such as those described in Part VIII by Wiener and Kahn) now in our hands, it could be catastrophic.

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*It may be interesting to note that the GNP of the primitive tribesmen who conquered Rome was to the GNP of Rome about what the Viet Cong's GNP is to that of the United States. Raymond Sontag, Professor Emeritus of Diplomatic History at Berkeley, informs me of this calculation.

Nietzsche was one of the most sensitive of modern philosophers to the problem of "transvaluation of values" and the role of the universities; and he was depressed over German higher education in the late nineteenth century:

> The entire system of higher education has lost what matters most: the end as well as the means to the end. That education, that _Bildung_ is itself an end--and not the state--this has been forgotten....The advancement of learning at the expense of man is the most pernicious thing in the world. It debases conviction, the natural purpose of the particular field of learning; learning itself is finally destroyed. It is advance, true, but its effect on life is nil or immoral.

In _Landmarks of Tomorrow_ Peter Drucker recalls an incident which makes a striking counterpoint to Nietzsche's comment on the excessive professionalism of the German universities:

> Thirty years ago Dr. William Dodd, a distinguished historian and Franklin D. Roosevelt's first ambassador to Hitler Germany, recorded with incredulous revulsion in his diary that Dr. Goebbels, the Nazi minister of propaganda, had a Ph.D. degree. What appalled Dodd was not the individual but the lack of values in the system that had produced him. He was frightened by the sudden realization that the German university to which he had looked up all his life had become vocational preparation for a job rather than embodiment of ideals and commitment to values. This is indeed the ultimate depravity; this, as Julien Benda, a French contemporary of Dodd's, called it, is the "high treason of the learned" (_La Trahison des Clercs)_.*

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*P.F. Drucker, _op_. _cit_., p. 156. Drucker cites another story that also is relevant to our interests, pp. 105-6: "I recall the president of a large American university who, in the spring of 1933, witnesses the taking over of an old and famous German university by a newly appointed Nazi

Yet in most historical periods the role of the intelligentsia has been to serve as apologists and legitimizers of power and mediators between old and new elites. The intellectuals' great betrayal, in Benda's eyes, was that they relinquished their autonomy and became the servants of the state. But was this really a "sell-out?" Cesar Graña in his study of the romantic movement shows that in the nineteenth century artists and intellectuals were caught in a double bind. They identified with the ideals of the revolution and of democracy, but the democratic revolution had swept away the only class that had sufficient taste, leisure, and money to serve as their patrons. Their alienation was less a function of their ideological opposition to bourgeois values--though that came, too--than a result of their not having a secure and esteemed social role.*

The point of all this is to suggest that the creation of an intelligentsia committed to humanist values is a more complex task than is often believed. Cries of "betrayal" can justifiably be called "naïve" if they are articulated without an understanding of the real value choices that confront the intellectual. One of the great students of American government, James MacGregor Burns, has written perceptively:

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commissar. 'The fellow,' my friend reported, 'made the most outrageous, most illiterate speech, insulting systematically every senior member of the faculty and sneering openly at learning, intellectual honesty and all the things the university stood for. Yet when he asked for questions, one full professor after the other got up and asked: "Will there be more money for plant biology?" "Will we get a bigger law library?" "Will we get more assistants?" When they were assured that there would be plenty of money for anyone willong to "co-operate," they all sat down, smugly content.

'What haunts me,' the college president went on, 'is the question: would my own faculty back home, so very liberal, so very brave in passing resolutions, act differently in a similar situation? Or would they too only be concerned with their own pet projects, see only their own shop, take responsibility only for their own footnotes?'"

*C. Graña, Bohemian vs. Bourgeois (New York: Basic Books, 1963).

> In a static or highly stable society the policy makers can rely on technicians to administer the status quo. The goals of the society are not in doubt, and innovation can be undertaken on the narrow basis of greater efficiency. But a society undergoing change in its basic valuations turns to the intellectuals to redefine the valuations and to reshape the Administration's or party's goals and the means of realizing them. Not only do intellectuals challenge existing assumptions and hence become useful to men in power, or men seeking power, during times of change; intellectuals also articulate that part of a nation's prevailing and rather inchoate ideology that bears on the problem at hand. For without ideological criteria there cannot be a basis of judging the relevance of new policy, and without new policy there cannot be innovation.*

Our age quintessentially is one of rapid innovation and, characteristic of such periods, it also is one of great questioning and transforming of values. In such situations, the intellectuals hold the critical scarce resource in society and are in a pivotal position to influence historical outcomes. But there are difficulties. Policy makers often find it hard to understand either the nature of their problems or the meaning of the advice they receive. And intellectuals, for reasons of temperament or dogmatism, may be unable to adjust to the pace and byplay of practical politics. Or, on the other hand, the intellectual may be so sensitive to criticism by political professionals that he will compromise too much go tain their approval, becoming, in the words of Kissinger, a "promoter of technical remedies" rather than an advisor on goals and policy.**

The traditional safeguard for this coöptation of the intellectual has been, of course, the intellectual community and the universities at large.

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*J.M. Burns, op. cit., p. 217.

**H.A. Kissinger, The Necessity for Choice (New York: Harper & Brothers, 1966). See also A. Rapoport, "Various Meanings of 'Theory'," The American Political Science Review, Vol. 52, No. 4, December 1958, p. 988.

In one sense, every intellectual is beholden to the purist on his left. Many have at some time felt guilty about concessions necessitated by political pressures, and hence are sensitive to the opinion of the more insulated university community which can articulate a "pure line" and criticize them for their compromises. Thus the intellectual community had established its own safeguard: the independent commitment of the university to the Western humanistic tradition, despite the sometimes illiberal policies of boards of trustees, ensured that intellectual activists would risk professional ostracism if they compromised too much for expediency.

But today the universities, like other institutions, increasingly are active in the broader economic and political processes of society. They have thereby gained a greater bargaining power within the organized system, but by virtue of this their institutional and ideological independence in criticizing the system has tended to wither away.* Thus the great danger becomes not the "betrayal" of this or that particular individual, but the eroding of the independent perspective of the universities themselves, the only institutions whose explicit function has been to embody and defend the Western humanist tradition.

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Voicing the concern of many thinkers, Herbert Marcuse describes this process of coöptation as characteristic of advanced industrial society:

> This absorption of ideology into reality does not, however, signify the "end of ideology." On the contrary, in a specific sense advanced industrial culture is more ideological than its predecessor, inasmuch as today the ideology is in the process of production itself. In a provocative form, this proposition reveals the political aspects of the prevailing technological rationality. The productive apparatus and the goods and services which it produces "sell" or impose the social system as a whole. The means of mass transportation

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*For a discussion of the impact of this development on the student movements in the industrialized countries, see A.G. Caranfil, "World-Wide Aspects of the Student Movement," Part IX of this report.

> and communication, the commodities of lodging, food, and clothing, the irresistible output of the entertainment and information industry carry with them prescribed attitudes and habits, certain intellectual and emotional reactions which bind the consumer more or less pleasantly to the producers and, through the latter, to the whole....And as these beneficial products become available to more individuals in more social classes, the indoctrination they carry ceases to be publicity; it becomes a way of life. It is a good way of life--much better than before--and as a good way of life, it militates against qualitative change. Thus emerges a pattern of one-dimensional thought and behavior in which ideas, aspirations, and objectives that, by their content, transcend the established universe of discourse and action are either repelled or reduced to the terms of this universe. They are redefined by the rationality of the given system and of its quantitative extension.*

Thus the political and economic organization emerging from our electronic technology claims the entire individual. Critical distance tends to be lost, and the process of introjection and identification with the system almost automatic. In the process, the "inner" dimension of the mind in which opposition can take root is eaten away. The loss of this inner distance, combined with the overwhelming efficiency of the organized system, blunts the individual's awareness that he has less and less individual and institutional space on which to stand to voice dissent. Without such space, the power of negative thinking--the critical power of reason--atrophies from disuse, and the vices of technocracy, as described by Marcuse, flourish.

To what extent can Marcuse's philosophic criticism be justified by objective data? One certainly would assume, judging from the propositions stated in the National Foundation on the Arts and Humanities Act (Public Law 89-209), that the institutions of higher learning are still bastions of an independent and critical humanist tradition. The Act reads in part:

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*H. Marcuse, One Dimensional Man (Boston: Beacon Press, 1964), pp. 11-12 (italics in original). Also see T.W. Adorno, Prismen. Kulturkritik und Gesellschaft (Frankfurt, Germany: Suhrkamp, 1955).

> ...a high civilization must not limit its efforts to science and technology alone....Democracy demands wisdom and vision in its citizens....The world leadership which has come to the United States cannot rest solely upon material power...

Nevertheless, Daniel Bell, in his penetrating and judicious study, The Reforming of General Education, suggests that the very existence of the college--the last stronghold of the liberal tradition--is today in danger. The new focus of the universities on research and professional training, Bell maintains, has had deleterious consequences for the instructional role of the undergraduate liberal college. Specifically,

> 1. The emphasis on research has created the power of the graduate school, since funds are more easily available to men teaching in the graduate school--if only because they have "command" over graduate students as research assistants. And with such funds goes the greater prestige as well. In the pecking order, thus, the individual who teaches undergraduates exclusively stands lower on the status hierarchy than one who teaches graduate courses; and within the college, the one who teaches only lower division courses stands below those who teach junior and senior courses.
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> 2. The chief consequence of the multiplication of professional roles has been the demand by the professor for a reduced teaching schedule and more time for research and public service. In many undergraduate schools, a four-course teaching load is still common, while in the larger colleges and universities a three-course load is the norm. Yet increasingly in the elite schools, professors will teach only two courses (one a research seminar)....In a university divided into graduate and undergraduate schools, the reduction in teaching load is almost invariably at the expense of the college course.
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> 3. It is in the recruitment of new and younger faculty that the orientation to the discipline and the easy availability of research funds pinch the most. In the past, a brilliant young scholar would have taught lower level or introductory college courses while working for his Ph.D., or in the first few years after he had earned his doctorate. But now the best graduate students are able to "buy off" teaching time with research money. Inasmuch as recognition and advancement are achieved primarily through publication rather than teaching, the impulse on the part of the younger men to substitute research time for the classroom is a strong one. Because the highest rewards and research money are to be found in the graduate school, the desire to move out of the college and establish one's career on the graduate level becomes equally compelling.

4. The impact of all this on the student--at least for many who go to the elite schools--is obvious. For them the college is a "way station," on the road to graduate school. Given this emphasis, and the lengthening period of graduate education, some universities have sought to "squeeze" the college by allowing for "advanced placement" credits in the freshman year (for work taken in the high schools), and by permitting students to begin graduate work in their senior year. In many subjects, moreover, the content of the undergraduate courses is no longer shaped by the college faculty, but is determined by the graduate schools, which specify the kinds of preparation a student needs. In this way, the independence of the college tends to be reduced.

Thus the graduate schools, committed to professional training and no longer even pretending to educate in a general humanist sense, assume that their students will acquire a liberal education before they arrive. But the colleges, rated by the percentage of their students entering graduate schools, take their cues from above. The national College Board examinations for high-school seniors in turn takes as its standards requirements set by the elite colleges, almost all of which are tied to one of the prestige universities. In this manner the disrespect of graduate research departments for humanist teaching and for transmitting non-professional values diffuses through the entire educational system. More demanding students claim that the universities, because they do not educate, have become "irrelevant" while, as though in response to such criticism, eminent educators claim that, to "reconcile" the conflicting aims of professional research and liberal education, specialization should start at matriculation.*

Yet students and university officials both would agree that a prime function of the universities is to educate an elite capable of guiding the destiny of our nation. And certainly both would agree that one facet of education is the creation of a shared set of values and ideas. Such a "common learning" emerged amongst humanists in the Renaissance, but was shattered by the Industrial Revolution. And in our own age, this common, unified view of man and the world has not yet recoalesced. In academics, each discipline has its own, increasingly esoteric symbols, concepts, and jargon, and the sovereignty of specialized departments continues to reign. Yet increasing knowledge should lead not to isolation and confusion, but to greater ease of learning and instruction. That this has not been the case has not been due solely to the advancement of knowledge, but more to our lack of a synthesizing view of man, a view that would constellate the diversity and apparent randomness of our new knowledge and give conviction and direction to our new powers of decision.

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*See, e.g., James A. Perkins, The University in Transition (Princeton, N.J.: Princeton University Press, 1966), pp. 43-45.

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Only with such a view of man will we have the perspective to assess critically the main directions and processes of American life. The chief role of higher education, it seems to us, is to foster and defend such an outlook, committed not to the state or the institutional powers that be, but to humanitas, to the ecumenical proposition that our values and our actions must be measured by their effect on man.

Why Save the Humanities?

If humanism means a view in which man is the measure of all things, our universities and colleges are dehumanized. The technocratization of our society and the changing role of the universities in it have contributed to this dehumanization; but it also is a product of our inadequate vision of the humanist tradition itself. As it is commonly stated by its defenders, the aim of a humanist education has been to provide a comprehensive understanding of the Western tradition and a unified view of knowledge and of man, to re-establish, in effect, the "common learning" shared by scholars of the sixteenth and seventeenth centuries.

But the effort to create such a body of shared concepts and ideas too often has frozen into the dogma that "learning" is contained in a specific number of great books; if only enough people could share the experience of reading those books, the logic runs, we would recapture the tradition and creativity of great ages of the past. Thus, "saving the humanities" too often has meant simply offering more "humanities" courses, scholarships, and research grants. But is the basic premise sound? Is it possible that a few great works can define the central issues of human experience as we confront them today, and that fundamental personal and social choices can be explored simply by reading a prescribed number of texts?

Evidence indicates the contrary. Stephen Graubard has pointed out that if intellectuals learned from each other in the nineteenth century,

> ...it was not because they were involved in inquiries less complex than those which presently engage us, but that the pace of life permitted a certain sort of communication which is now difficult to achieve, and also, that their number was small enough for them to form fairly compact societies....The values of the society militated against an individual defining himself wholly by what he did.*

It thus may be possible that the creation of a common culture, of a humanist intellectual community, is not a simple, direct product of a shared body of readings or metaphors, however much these may facilitate the exchange of ideas. Rather, what may be more important is the _idea_ of a living past and a sense of continuity between the condition of men confronted with ethical choices in former times and our own ethical alternatives today. If this type of awareness is to come from books, the books must be related to contemporary circumstances as they are experienced by the reader. Striking evidence of higher education's failure can be found in the Jacob study, which reported that apart from three or four colleges, the effect of college teaching on student values is nil. What little change in values does occur comes from student subcultures, perhaps the only contemporary equivalent of the "compact societies" of scholars to which Graubard refers.*

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*Unpublished planning paper for _Daedalus_ issue on "Science and Culture," Winter, 1965, quoted by D. Bell, _op_. _cit_., n. 4, pp. 282-3.

Jacob's findings hold many implications for curricula, teaching methods, and the social context of instruction. They also raise the question: "Are students' values so wrong? Why should they change?" This is an important and sensible question, but it entirely misses the point. The point is not that students and leaders should simply "know" the great books or have the "right" values or be able to articulate a "good" philosophy of life. Our problem rather is that for large numbers of Americans one's "philosophy of life"has no bearing whatever on the way one lives. In a situation like this, even "good" values may become irrelevant to one's actions. Increasingly, people may easily say, "Of course I believe in humanity, love, virtue, etc. But the main thing is to get the job done." With this attitude, the pitfalls of technocracy and professionalism can become gaping chasms.

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Just as values are defined by action, action defines values. The essence of humanist awareness lies in the articulation of the relation between the two. Failure to do this, as Gunnar Myrdal showed in his classic

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*P.E. Jacob, Changing Values in College, An Exploratory Study of the Impact of College Teaching (New York: Harper & Brothers, 1957).

The American Dilemma, can lead to a social schizophrenia and a degeneration of social and political morality at all levels of society.

This disjunction between values and action, between idea and experience, is not a product of the "moral corruption" of a people, though that may come later. Rather, it is a circumstance characteristic of people caught in a double bind. A double bind can exist for whole cultures when they reach what Kenneth Boulding calls a "boundary at which the system suddenly changes into another or passes some point of no return in its dynamic processes."* When social changes become qualitative, the old values don't make sense--they are given ritual adherence by most, reiterated compulsively by the right and renounced and flouted by the left.

In many emerging nations today, the traditional value systems still are out of joint with the new Western experience. Some of the old patterns simply collapsed before the onslaught, as the stone-ax culture of the Australian Aborigines collapsed before the steel ax. On the other hand, some value patterns are preserved--as in the verbal adherence to democracy in Mississippi or the belief in national omnipotence in Egypt or Syria--by simply suppressing an awareness of experience. Such cases are frequently dangerous and always pathetic, like Cervantes' meddlesome nobleman, full of noblesse oblige but so poor he must repair with yellow thread his violet hose.

Happily, one can also cite more hopeful examples--Periclean Attica, Weimar with Goethe, and possibly Lebanon, Mexico and several other modern states. What seems to characterize such "successful" periods or societies is not that they had somehow codified the relation between idea and experience, between value, perception and behavior and, having discovered the formula, stopped thinking about it and taught it to their descendants. Rather, what seems crucial to the success of these periods, what seems to define them as a group, appears to be a tensed awareness that a relation between value and action exists and that the dynamics of this relation are the central question in a humane society.

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*K.E. Boulding, The Image (Ann Arbor: U. of Michigan Press, 1961).

The successful adaptation of values also relates to the concept of "critical distance" mentioned previously. Just as a man needs some inner psychological and social space to critically examine his experience, so whole cultures must have such perspective if they are to transvalue their traditions and have their values shape their actions. Japan, for example, had a high culture which could stand on a par with the West in all areas but technology. It perhaps was this cultural self-esteem which gave her the perspective to distinguish what aspects of Western ways she wished to adopt or ignore. In Lebanon, something like this distance is created by the balancing of Arab, French, and Anglo-American cultures. A similar condition obtained in sixteenth-century England, where Elizabeth kept Protestants and Catholics in agonistic quietude while the nation rose in balanced flight. Mexico, the only Latin American country to affirm its Amerindian heritage, in doing so has perhaps created additional internal cultural space in which to stand off obstreperous gringo influence and shape its own identity.

The successful re-relating of ideas and experience can also be seen in the arts. The Renaissance transmitted medieval Latin culture into newly discovered classical forms, just as the cultural flowering in northern Europe a century later was born of the union of earlier Renaissance forms with the local vulgates. The great nineteenth century literature of Russia, a more recent example, was created by men whose first tongue was often French (Pushkin, Turgenev, Tolstoi) and who applied the fully developed tradition of French culture to the unspoiled richness of the Russian vernacular. A similar burst of creativity is occurring with the intromission of the mature Western literary tradition into the dynamic "virgin" media of cinema.

In the United States, unlike new nations being struck by mechanical revolution from without, we are being enveloped by an electronic revolution from within. This electronic revolution has made obsolete our traditional Cartesian view of the world, but we have not yet replaced it with a more adequate vision.* Our vocabulary abounds with terms of entities but not of relations, with terms of cause, but not of configuration. It is easy for us to describe dualities--mind and body, constancy and change, individual and society, "idea and experience"--so much so that dualism almost has become a definition of thought. We are rich in concepts which assume linear progression or static dichotomy; what we lack are terms describing interacting and interpenetrating processes. Yet in our electronic age of instant awareness, this increasingly is how we experience reality. As the level of theoretical knowledge rises in physics and chemistry we increasingly are able to transform anything into anything else, to use glass for fabric and petroleum fuels for building materials, to summon forth instantaneously--through automated data retrieval--other goods to serve whatever purposes and combinations we wish. The result is that increasingly in our daily living we become concerned with the function of a phenomenon rather than its intrinsic meaning as a discrete object.

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*I use the term "post-Cartesian" in the same sense intended by Jean-Paul Sartre. See Being and Nothingness, translated by Hazel E. Barnes (New York: Philosophical Library, 1953), p. 374. See also B. Russell, A History of Western Philosophy (New York: Simon & Schuster, 1960), esp. pp. 557-559.

This change in perspective also means a change in the "ratios of perception," for function involves a simultaneous awareness of the total environment rather than the linear exposition of some ideal inner logic. We still _think_ of the world in causal terms, but increasingly we _experience_ it as mobile, a moving web in which action in one part creates action or a new propensity for action in all the others. Thus, one indirect impact of electronic technology has been to throw our senses increasingly out of joint with our ideas. And as what we think ceases to correspond with what we feel and do, the relevance and influence of values on action gradually is eaten away.

How can we create an "inner distance" from our technology by which to see how it has affected our sense of perceptions, and in so doing _ratio_nalize the disjunction between our ideas and what we feel? It seems not to be easy. Marshall McLuhan recalls the myth of Narcissus as an example of the tendency for men to believe the extensions of themselves have an independent life of their own:

> The youth Narcissus mistook his own reflection in the water for another person. This extension of himself by mirror numbed his perceptions until he became the servomechanism of his own extended or repeated image. The nymph Echo tried to win his love with fragments of his own speech, but in vain. He was numb (narcosis). He had adapted to his extension of himself and had become a closed system.*

The point of this story is not simply that men become fascinated and numbed by their extensions, but that they easily cease to realize that they _are_ extensions. Obviously, and contrary to the usual American interpretation of this myth, Narcissus would have felt very differently about his reflection if he had realized it was merely an extension of himself. Similarly, in some dependent love relations, each partner can maintain the attraction only by imputing mystical qualities to the other. Shakespeare rightly called such love a kind of madness. But what shall we call a whole society's infatuation with its own technology, a society's treating its technology as an autonomous, ungovernable and awesomely powerful force, much as primitive peoples treat the supernatural? This we must call idolatry--the real atheism, not of pulling down the old gods, but of making one's own creations divine.*

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*M. McLuhan, _Understanding Media: The Extensions of Man_ (New York: McGraw-Hill, 1964), p. 41.

In shaping a post-Cartesian humanist outlook, then, in making man again the measure of all things, it seems that changes in the character of our _sense_ perception of the world are very much the heart of our problem. What _does_ one do with grief when one sees a son blown to bits just before the soap ad, as happened recently to a woman watching a newsreel of Vietnam? How does one feel about the aging of the flesh when the best of Dietrich--from five decades on stereo, film, Broadway, or TV--are available any night of the year?

The Hebrews and other tribes had an oral wisdom, a kind of verbal Dear Abby, that gave operational advice on all such exigencies of life;

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*See N.O. Brown, _Love's Body_ (New York: Random House, 1966), esp. pp. 114 and 182, and M. McLuhan, _op. cit._, p. 45. As explained in the 113th Psalm, our extensions expedite all our senses, and may even come to absorb the senses themselves:

> Their idols are silver and gold,
> The work of men's hands.
> They have mouths, but they speak not;
> Eyes they have, but they see not;
> They have ears, but they hear not;
> Noses they have, but they smell not;
> They have hands, but they handle not;
> Feet they have, but they walk not;
> Neither speak they through their throat.
> They that make them be like unto them;
> Yea, every one that trusteth in them.

and the oral tradition of the early Greek poets served a similar function. But with the advent of a more individuated, literate society, the practical wisdom of Homer and the prophets gave way to the discrete forms of Platonic logic, which has been the basic mode of Western thought since then.*

Yet with the instant awareness and magic social mobility of our electronic culture, cognition by classified data and linear thought becomes more and more out of joint with the way we experience the world. That this is true is evidenced by certain new formulations emerging in a number of advanced areas of modern life. The big word at IBM, McLuhan observes, is not information but pattern recognition. This may be prophetical. Sensory bombardment is almost unavoidable in the large modern city, or even in the country home if it is wired for radio, television, stereo and tape. This swamping of the senses leaves one with the alternatives of catalepsy--the rigor mortis of ideas on the right--or hallucination, the flip-out mysticism of the left. Or, in some centers, one can choose pattern recognition.

Something like this is also emerging in the arts. At the same time that Picasso and Kandinsky were shattering the single focus of perspective in painting, Schoenberg and Varese went beyond the single linear focus of tonality in music. The cubists rationalized form and perception by representing simultaneously the numerous views we have of a phenomenon as we perceive it in time (as if the "real" Marlene Dietrich were represented as an integration of all the Marlenes we can see simultaneously today).

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*See E. Havelock, Preface to Plato (Cambridge, Mass.: Harvard University Press, 1963), cited by M. McLuhan, op. cit., p. vi.

Schoenberg rationalized form and perception by arranging music so that all twelve tones of the chromatic scale are equal, and Varese went even farther by opening his music to all sounds, not just pitched sound.

Just as the literary tradition of classified, printed data is being replaced by verbal communication and the oral report, so in music the compositional tradition associated with notation that has obtained since the early Renaissance is being replaced by a pre-eminently oral tradition, both in art music and in acid rock. No notational system is capable of reproducing the complex texture of the music of the Beatles (and their sound engineers),* for example, any more than a written report could reproduce the integrative effect of a White House briefing or a Hudson seminar.

Herman Kahn and John Lennon, though they might hate to admit it, may be sharing in the recreation of a tradition. The key phrase in both their works is pattern recognition. Just as Lennon is an heir to the popular jongleur tradition of the Middle Ages and the wisdom songsters of the classical period, so Kahn and his associates are seeking to recreate an integrative oral encyclopedia of practical wisdom for elite leaders ("decision makers") in modern times.**

In a more formal way, one can see the emergent centrality of pattern recognition in the study of decision and information systems, which is rapidly becoming a pivotal unifying discipline in the most advanced circles of management. This type of integrative awareness seemed to be what Huxley was reaching for when he contrasted the "accomplished intellect" with the graduates of our professional schools "to whom no principle of integration is given":

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*See J. Peyser, "The Beatles," The Columbia University Forum, Vol. X, No. 3, Fall 1967, pp. 16-22.

**See Kahn and Wiener, The Year 2000, op. cit., "The Objectives of Future-Oriented Policy Research," pp. 390-409.

> The web of understanding which, in the mind of the accomplished intellectual, connects the atom with the spiral nebula and both with his morning's breakfast, and the music of Bach, the pottery of neolithic China, what you will--this network of cognitive relationships is all but completely lacking.*

Perhaps the Zen master meant something like this when he said "The universe is in the head of a dead cat." Blake certainly meant this when he asked that we be awakened "from single vision and Newton's sleep." Yet despite such protest and some hopeful signs, intellectual activity in the universities continues to be dominated by narrow professionalism and radical empiricist research. It is hardly possible to name a germinal thinker of our times--Mumford, Riesman, Cassirer, Parrington, Schroedinger, Matthiessen, Miller--who was not steeped in a cross-disciplinary, problem-oriented "functional" approach to learning, and largely dependent on it for his breadth, originality, and bite. But virtually all of these scholars arrived at their interdisciplinary perspective on their own, against the universities rather than with them.**

And as long as the humanities rest in the hands of specialists alone this will remain the case. The very spirit of humane learning is incompatible with an educational system which forbids general, integrative learning, which increasingly is the case in our graduate schools and colleges. And this brings us back to our central theme--the creation of that critical inner distance in which can reside an awareness of the disjunction of value and action and an effort to re-relate them again. And this is exactly the prime function of the humanities and of a humanist intelligentsia. Through their idea of the past, through their perception of the continuities of basic ethical choices in former times and today, they can give us distance from our extensions and provide us with a renewed perspective for critical self-judgment. For if we lack such ideological distance and self-judgment in the face of unharnessed technological and social change we will be left without criteria for judging the morality, relevance or effectiveness of new policy. And without appropriate new policy, we will be the victims, rather than the makers, of our fate.

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*A. Huxley, Ends and Means (London: Chatto & Windus, 1937), p. 196.

**See E. Larabee, "Saving the Humanities," Commentary, Vol. 42 (December 1966), pp. 53-60.

Future Contexts for Curricula

What emerges from our discussion is a perception of the twofold aspect of higher education--the training of specialized professionals who contribute to the sum of knowledge in their respective disciplines, and the education of men to an awareness of the unity of knowledge and the relation of values and behavior in past times and today. One aim may nourish and interpenetrate the other or, as is the tendency today, each, in isolation of the other, can become unsound or irrelevant.

The conventional "solution" to reconciling general and specialized learning has been to give prospective specialists an initial grounding in general studies--"more" courses in literature, history, philosophy, etc. But even where this much has been done, it seems grossly inadequate. The problem goes much deeper; departmental parochialism and narrow specialism have struck the humanities themselves.* Warren Weaver comes straight to this point:

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*"The problem is not just the lack of cultivation of the person," Daniel Bell writes, "but the increased narrowness of the intellectual tasks themselves." (D. Bell, op. cit., p. 155.) See also A.F. Whitehead, Science in the Modern World (New York: The Macmillan Company, 1960), pp. 282-283.

> I think that--as a result of this intellectual revolution--something ought to happen to the educational structure of our country. I think that it's very difficult to make the necessary experimental changes within the traditional institutions. They inherit so much from the past--from departmentalization, for example. I used to be the chairman of a department and I know how they are handled. The chairman of a department has a budget and this belongs to him; he has a certain number of professorships assigned to him. Is he going to give these away to other fields that are intermediate fields? Well, you can bet he's not going to do so![*]

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The term humanity refers to an outlook of humaneness, an ethical view which centers on relations between men. It also refers to the polite learning imparted by those who exhumed the Greek and Roman classics during the Renaissance. But the former does not necessarily follow from the study of the latter. Study of the "humanities" may be a vehicle to a unified humanist outlook; and it may not, as all of us know who took the course on the feather in Tristan's cap. Similarly, the most "technical" subject can be taught as a "humanity." Peter Drucker recalls that:

> The most general education I have ever had was in a course in a highly technical subject, admiralty law, which a martinet of a teacher presented as a record of Western society, Western technology, Western legal thought and Western economy--yet never discussing anything but the specific details of a case.[**]

The question seems to be less one of specific course content than of conception and approach. The subject matter of education may be romance philology or molecular biology. If either is presented as a set of "facts" they will remain a narrow specialty. If either is treated as a vehicle for elucidating the interrelations of a unifying set of concepts, coherent unto each other and relatable to other disciplines and to man, then either may be taught as a humanity.*

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[*] Statement by Warren Weaver, Chairman, Board of Trustees, Salk Institute, Biltmore Hotel, New York City, May 6, 1963.

[**] P. Drucker, op. cit., p. 141.

The presentation of knowledge in terms of disciplines, in terms of strategies for understanding, would humanize both "technical" and "liberal" subject matter. For the point is that the general can be understood only when exemplified in the specific, while specialized learning is little more than rote dogma unless it is grounded in a context of general theory. What Joseph Schwab says of the sciences applies equally to humanities:

> No mere updating of course content will suffice. Mesons, phosphate bonds, DNA, and population genetics can be taught just as dogmatically and rigidly, and as little to the present purpose, as the nineteenth-century cell theory or the impervious atoms and elements of Mendeleef's periodic table.**

What links general education with specialized professional training, then, should be their common emphasis on conceptual innovation. Because of this, the foundation of a humane education must be an understanding of the process of inquiry and discovery itself--how a particular media, or discipline, or ethical outlook, establishes its basic elements or concepts, how they are blended and revised in the face of new problems, and how criteria are established to recognize and pursue one pattern or development rather than another.***

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*The National Foundation on the Arts and Humanities Act (Public Law 89-209) defines "humanities" to include, "but not be limited to, the study of the following: language, both modern and classical; linguistics; literature; history; jurisprudence; philosophy; archaeology; the history, criticism, and practice of the arts; and those aspects of the social sciences which have humanistic content and employ humanistic methods." This list serves a necessary legislative purpose, but here every subject with "humanistic content and methods" in terms of the point I am making might equally well be included.

**J.J. Schwab, "The Teaching of Science as Enquiry," in Teaching of Science (Cambridge, Mass.: Harvard University Press, 1962), p. 39.

***See D. Bell, op. cit., p. 157, and J.J. Schwab, "What Do Scientists Do?" Behavioral Science, Vol. 5, No. 1, January 1960.

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Today we are learning--in business organization, information media, materials production, and the arts--that almost anything can serve as anything else. (We no longer study "grammar," the parts of speech; we study "communication," the whole of speech, and we design communications systems according to what we have to say and how we want it to be known.) Could not a similar approach be taken with our universities, in curricula, teaching methods, and institutional structure? Systematic thinking, working back from a wide range of hypothetical or desirable "outcomes," might yield stimulating and useful results.

We cannot gear our universities to train specialists for branches of learning that have not appeared, nor can we train technicians for industries that do not exist. But we know that in both the universities and the corporations routine and labor-intensive occupations increasingly are being computerized and automated. And we can anticipate, for both specialized professionals and for a humane intelligentsia, an increasing and preponderant need for people who are proficient in at least four irreducibly "human" skills--cognitive, emotive, artistic, and ethical:

1. Cognitive processes. As our society comes more and more to live by innovation, greater primacy will be placed on the ability to codify particular knowledge into general theoretical systems which can be related to many diverse situations. Daniel Bell, a cognitive extremist, leaves little room in his ideal curriculum for non-verbal, non-literate types; but what he says about the cognitive, literary, theoretical dimension of perception is both thorough and trenchant. Bell asserts that a curriculum can create "self-consciousness in relation to tradition" to the extent that it demands

of the student that he (1) "overcome intellectual provincialism," (2) "appreciate the centrality of method"--i.e., the role and technique of conceptual innovation, (3) "gain an awareness of history," (4) discover "how ideas relate to social structures," (5) "understand the way values infuse all inquiry," and (6) apprehend "the civilizing role of the humanities." An ambitious program, but Bell presents a convincing case for both its necessity and feasibility.*

2. Emotive processes. Effective management is quintessentially an exercise of sensibility in human relations, for example in fitting the man with the job and creating an atmosphere in which differing personalities can work effectively together. In the complex organizational structures of the future, made possible largely by computers and other managerial hardware, the "soft" skills of face-to-face sensibility will be needed at least as much as today.

In the emerging institutions, it is the job that determines the authority and responsibility of the holder, not his position in a static organization chart. This original authority springs from the objective requirements of the function itself rather than from the power of the man above. And just because of this, interfunctional integration requires an even closer exchange of data, ideas, and talents. Thus the role of the manager increasingly is shifting from "boss" to team leader. His effectiveness and stature stand or fall not on his formal authority but, besides his substantive knowledge, on his emotive skills in working with his colleagues.

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*D. Bell, op. cit., p. 144 ff.

At the same time, as our economy requires fewer and fewer workers for the production of goods and services, there will be an effort to create jobs in the not-for-profit sector, such as teaching, community counseling, care for the aged, etc. At first this will be done to "avoid unemployment," but eventually, as this group of workers grows and becomes a constituency unto itself, it will come to justify its activities on non-economic, humanist grounds.

Thirdly, in an atmosphere of increased leisure and affluence, people may come to concern themselves more with the quality of their lives than with their standard of living, and may place greater value on personal emotive skills than is the case today.

To produce such emotive skills curricula might be shaped not only to stimulate conceptual awareness, but also to produce both discipline and spontaneity of feelings. It may be noted in this connection that Zen training was practiced in medieval Japan by warriors to maintain an inner quietude on the field of battle. A similar regimen might be useful preparation for the pressures of administrative office. Other techniques might include sensitivity, T-group, and role-playing methods, not just as separate courses but as a general instructional methodology for all curricula. Another method might be to use the college itself as a social laboratory. To do this, the social environment would have to be small and closed enough to ensure high propinquity among students, so that insights gained from face-to-face social relations could be fed back into the classroom. One other method might be a kind of "existential sociology." Georg Simmel could be considered the founder of this "school"; Erving Goffman is one of its practitioners today. (Goffman studied mental hospitals by becoming an inmate; he studied risk-taking by becoming a croupier in Reno.) The "inner space" thereby acquired is vital to a humane intelligentsia; in a number of professions it is equally vital for effectiveness in personal relations.*

3. Artistic processes. In Japanese script the same character serves to represent both "fine" art and "folk" art. In ancient Greece there was no word for art at all, only skill; apparently they tried to do everything well. Today, our technological capability of transforming both data and matter is giving us the power to shape our entire environment as a work of art.

Yet our cognitive view of the world is still largely purposive and linear, the opposite of integrative artistic awareness. John Maynard Keynes' comment on the mentality of economic man is relevant in this connection:

> [In post-industrial society] we shall inquire more curiously than is safe today into the true character of this "purposiveness" with which in varying degrees nature has endowed almost all of us. For purposiveness means that we are more concerned with the remote future results of our actions than with their own quality or their immediate effects on our own environment. The "purposive" man is always trying to secure a spurious and delusive immortality for his acts by pushing his interest in them forward into time. He does not love his cat, but his cat's kittens; nor, in truth, the kittens, but only the kittens' kittens, and so on forward for ever to the end of cat-dom.**

This tendency to evaluate reality in terms of its economic utility rather than its intrinsic qualities or its environmental effects was the psychological counterpart of utilitarianism in social philosophy and the assembly line in production. But electronic technology has given us a new power to shape our sensory world. Unless we can create sufficient inner distance from this technology and see it as an extension and a creation of ourselves, we will be swallowed by it much as the icon swallows the senses of the beholder.

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*Alan Watts discusses the need for such "emotive" professions. See Beyond Theology (New York: Meridian, 1964).

**J.M. Keynes, op. cit., p. 370; discussed in Kahn and Wiener, op. cit., Ch. IV.

When Beethoven was asked the meaning of a sonata he had just played, he answered by playing it again. Braque's response to the questions of an American lady is similar: "Madam, you will never understand. You wish too much to know." To the trained perception of the artist, it comes automatically that the significant content of extnesions lies in their total effects on our sensory environment, not in the quantitative, purposive tasks we set for them.

The same is true of technology. We have constructed electronic devices to expedite short-term cost-efficiency advantages, without realizing they also have expedited our sense perception and have effected a long-term qualitative change in our environment. The perceptual world of mechanical purposiveness was linear; the perceptual world of electronic functionalism is integrative.

Inevitably, however, there is a conceptual lag. Changes in our sensory environment are perceived before they are conceived; indeed, had they been conceived beforehand they would likely have been opposed. Thus we still think linearly, and we have very sophisticated means of defending this mode of thought. Efforts to create a cultural style or perspective outside the linear model, like the Edwardian dress of the hippies, appears next season in the ads for Vitalis. "Arty" styles of life and other modes of dropping out or dissent are no longer a threat to the pervasive narcosis of technology; they become a ceremonial adjunct of practical behaviorism, digested by the status quo as part of its healthy diet.

The artist is relatively immune to this absorbtion. As McLuhan points out:

> The effects of technology do not occur at the level of opinion or concepts, but alter the sense ratios or patterns of perception steadily and without resistance. The serious artist is the only person able to encounter technology with impunity, just because he is an expert aware of the changes in sense perception.*

It may be to art, then, that we can look for an antidote for our times. Through his awareness of the effects of electric technology on his senses, the artist can resist cooption and even set up "anti-environments" into which the non-artist can enter. From the alternative perspective of such anti-environments, we may be able to evaluate more critically our habitual environment and see, perhaps, how it might be recreated more humanely and esthetically.

4. Ethical processes. Though ethical speculation is not one of our society's major preoccupations, with the vastly enlarged choices now opening to individuals and organizations, it is possible to imagine that an ethical perspective will become a central unifying viewpoint in the decades ahead. As today we have strategy briefings in government or sales briefings in business, the corporation or government office of the future might have briefings on ethics. As today they have bureaus of Public Relations, in the future they may have Departments of Ethics.

The ethics curricula of the future would not consist of three courses in the philosophy department, as is the case today. Rather, all courses might be shown to have ethical implications, and that these implications can be more rational, explicit, and coherent by logical thinking and empirical knowledge.*

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*M. McLuhan, op. cit., p. 18.

In addition to philosophic and logical approaches, a curricula in ethics might adopt the case-study method used so successfully by law and business students at Harvard. It has been observed that business students rarely admit any objective except profitability into their analyses; but if "ethical behavior" rather than profitability were the end point, and suitable problem situations employed, the method might be as effective in training moral men as it is in shaping executives.

Another exercise of an ethics curriculum might be to devise codes of ethics for various occupational and social roles. If such thinking gained currency, perhaps scientists and engineers would take a "Hippocratic" oath not to use their skills for building death machines. We say that a man has "the morality of a butcher," but this very phrase suggests that there _is_ a morality even in this mundane profession that goes beyond giving fair weights and measures.

Ethical speculation might also begin closer to home. What an eighth-grade teacher said of her students may be even truer of college youths:

> At the beginning of the year when I said to the kids that we may eventually become involved in solving some problems, they went down a list of problems that they felt were worthy of being solved--air pollution, the War in Vietnam, general poverty in the country. When I said, "what about here--what about something in the school that should be changed?" they said, "you can't change the school; how can we do anything about the school?" It was so close that it loomed so large, that they

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*Provided that fundamental ethical propositions are stated with sufficient precision, other ethical propositions can be derived from them, much as theorems may be derived from axioms. See A. Einstein, "The Laws of Science and the Laws of Ethics," _Out of My Later Years_ (New York: Philosophical Library, 1950), p. 114.

> were willing to take on the whole world. They've reviewed this thought and they have now reached a realistic point: "Maybe we can begin to attack here." In effect, we can start; we can follow it for years; we can become aware and involved now--but we're going to start with something close, not in the clouds.*

Though such an approach would be anathema to some administrators, it might satisfy at least three of Daniel Bell's requirements for a liberal education--"To show how ideas relate to social structures; to understand the way values infuse all inquiry; to demonstrate the civilizing role of the humanities."

Some Comments on Teaching

The dominance of research scholarship and the degrading of teaching is an all but universal fact in American higher education. Though teaching in the colleges is somewhat less poor than in the universities, in both the vast numbers of students, intense competition for federal research funds, and political and professional pressures for research scholarship, all have contributed to the downgrading of the status and support of the professor who wishes to teach. Moreover, pressures in this direction are likely to increase. As theoretical knowledge becomes increasingly more important than applied knowledge, the universities, as the prime generators of new theory, can be expected to receive an increasingly larger share of national investment in R&D. The forces supporting the takeover of higher learning by research scholarship, and the consequent denigration of teaching, are therefore likely to grow.

The defense of teaching is made all the more difficult by the dearth of knowledge as to what makes a "good" teacher and how these skills or circumstances can be duplicated systematically and instituionally.* Studies have been made, however, which may give us some general direction. Robert White has demonstrated that satisfaction we receive from mastery of our environment (which he terms a "competence motivation") may serve as motive energy in more structured learning situations.** In effect, he says, we get interested in what we get good at--interest is sustained through increasing mastery of the situation at hand.

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*As reported by H.R. Hatch, "Children as Urban Planners," The Urban Review, Vol. 2, No. 3, December 1967, p. 24.

This pleasure in mastery, however, is unlikely to be effective in a formal learning situation unless it is supported by at least three other conditions--what we may call order, reinforcement, and reciprocity. The importance of order is evidenced by the research of the psychologist Zeigarnik, who found that tasks that are interrupted and then returned to are generally remembered better than if they were completed without interruptions. However, this effect obtains only if the task itself is structured, if it has a definite beginning, a step-by-step middle, and a discernible end. If the task is without order or with no means for checking progress, learning is not stimulated by interruptions. The same may be true of learning in general; without some meaningful integration of our task and a means of knowing how well we are doing, we are unlikely to give our best.

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*There is far less evidence, for example, on the best method to teach reading than on the best method of raising potatoes. Doubtless in neither case is there a simple, uniform answer; one will depend on the soil, the season and the climate, the other on the visual or auditory memory of the child, his age, and the general learning environment. Yet we tend to introduce new teaching methods, and to retain old ones, with far less evidence than would satisfy even a mediocre agricultural research station.

**R.W. White, "Motivation Reconsidered: The Concept of Competence," Psychological Review, 66:297-333 (1959).

A second factor may be called "reinforcement," which I mean in a broad social sense. For our eagerness to master a task will vary depending on whehter it is associated with other "external" factors, such as status, security, wealth, etc. In this connection, as Winterbottom and others have shown, there is striking variation between cultures and classes as to what types of task-mastery are esteemed and reinforced by social approval.*

The force of this "social approval" lies in the fact that we tend to act in terms of the expectations of others, and to adjust our behavior to the norms implicit in our immediate environment. Over cocktails we wear our "party personality," in the office we are "professional," at the Sunday tennis match we are "sportsmanlike." All conventional social situations have their sets of mutual expectations, and the man who cannot assume the roles appropriate to various circumstances at best is considered a bore. We show ourselves to others by these roles, and through them we know who we are.**

But this hardly exhausts the matter, for there are innumerable situations in which "role conflict" exists or in which the official expectations of the situation exactly oppose the behavior required to get along. Note, for example, the role conflict of a young man in the presence of both his domineering mother and his dependent girlfriend. Examples of more institutional role conflict might be the student seeking general education in a "liberal" college where only research counts. Thus, in a complex urban pluralist society which is _characterized_ by conflicting norms and roles, the influence of "social approval" or "reinforcement" necessarily involves the question of who is approving what.

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*M. Winterbottom, "The Relation of the Need for Achievement to Learning Experiences in Independence and Mastery," in J. Atkinson, ed., _Motives in Fantasy, Action, and Society_ (Princeton: Van Nostrand, 1958), pp. 453-478.

**See E. Goffman, _The Presentation of the Self in Everyday Life_ (New York: Doubleday, 1959).

In addressing this issue social scientists have pointed to the "reference group" as a psychological pivot to which one looks for guidance and upon the basis of whose criteria one evaluates the expectations of situations or roles in general. The dynamic of this process appears to operate through what psychologists have called an "identification figure" and sociologists a "role model." When we feel we have succeeded in "being like" such a figure, we are pleased and, conversely, we suffer when we have "let him down." Insofar as our model is a certain type of person or belongs to a certain occupational or social group, our personal loyalties to our models are extended to some "reference group," thereby linking us, psychologically and operationally, to society at large.

While this account is oversimplified, it underlines one feature which is vital to the learning process--as the role model is "internalized" it assumes an independent, self-sustaining character. It assumes, in fact, the attributes we refer to when we say a man _has_ character. Jerome Bruner has put this well:

> Identification...passes over to the learner the control of punishment and reward. Insofar as we now carry our standards with us, we achieve a certain independence from the immediate rewards and punishments meted out by others.... It has been remarked by psychologists that identification figures are most often those who control the scarce psychological resources that we most desire--love, approval, sustenance.*

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*J. Bruner, "The Will to Learn," _Commentary_, Vol. 41, No. 2, February 1966, pp. 41-48, esp. p. 44.

Without an appropriate role model within the university, then, without someone who can dispense approval and sustenance, if not love, it is unlikely that the student will relate himself to an academic reference group and be self-motivated to perform most effectively the behavior expected in an academic environment.

But let us carry the argument a step further. How does this process of internalization of the standards of the role model take place? As Bruner points out:

> It is not so much that the teacher provides a model to *imitate*. Rather, it is that the teacher can become a part of the student's internal dialogue--somebody whose respect he wants, someone whose standards he wishes to make his own. It is like becoming a speaker of a language one shares with somebody. The language of that interaction becomes a part of oneself, and the standards of style and clarity that one adopts for that interaction become a part of one's own standards.*

Thus learning implies not only order, but also reinforcement and reciprocity. The simplest example is that of a child learning from the parent to use the pronouns "I" and "you" correctly. The learning of culture in general seems to operate in this way. We attain mastery of at least part of the corpus of values, skills, and attitudes that are our inheritance through the intervention of some effective mediator who can reinforce and reciprocate our desire for mastery, our interest, and our personal concern.

If this analysis is even partially correct, it may have at least two implications for the methods of teaching. First, it seems that to be most

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*Ibid., p. 45. For elaboration on the example of reciprocal learning above, see J.S. Bruner, "The Cognitive Consequences of Early Sensory Deprivation," *Psychosomatic Medicine*, *21*, 2:89-85 (1959) and R.H. Weir, *Language in the Crib* (The Hague: Mouton, 1962).

effective the learning process to the greatest extent must be its own reward. If material is organized in a structured and flexibly paced manner, and if there is precise and systematic feedback, the pleasure in mastery will be an immeasurably more powerful stimulus than ranking in the class, institutional "honors," or the abstract promise of higher social status or income due to greater learning. Secondly, it appears that this desire for mastery will be reinforced if the task itself is valued in the environment and if the student's interest is reciprocated by, to use the Christian term, some "witness" for learning.

These observations, it seems to me, suggest a central aim towards which we should direct our practical efforts; concentrate on producing teachers who can function as mediators in the learning process (the only exclusively "human" part of teaching), and automate everything else. The people who recoil in horror at "automated education" at the same time make use of our greatest mechanical aid to education--the printed book. The book certainly has not reduced the importance of the teacher. The reverse is true, and will be truer still through the use of electronic technology as a teaching aid.

One reason why mediocrity and incompetence are tolerated in teaching more than other professions is that traditionally there have been few performance standards, no empirically controllable means of telling the good teachers from the poor. But by automating the information content of the learning process and incorporating performance feedback directly into the material itself, it will be much easier to evaluate the effectiveness of the teacher as a teacher--a shaper of values, insight, sensibility, and character--rather than as a dehuman transmission belt for data.*

Unless the teacher is freed from his role (and his image) as a mere diffuser of knowledge he will not escape the stigma of "someone who could not make it in research." Yet the function of teaching must justify itself--not the transmission of knowledge but the building of men. When the students say their educations are irrelevant they refer, more than anything, to the failure of the universities to provide teachers who, by their committed examples, _make_ learning relevant to their own lives and to those of their students. The words of the Foote Report on the University of California may be taken as general:

> Somehow this function of "service" (outside research, etc.) has gotten out of hand so that it has come to dominate the direction, form and tone of the university....(Less than 20 percent of juniors and seniors intensively interviewed in one department) could be described as intellectually engaged in their major, while the rest were discouragingly indifferent...."Instruction" tends to usurp the place of inquiry; specialized "training" gradually commences at ever earlier stages. ...The result is that instead of the warmth and cordiality which are the natural accompaniments of learning, relationships tend to be remote, fugitive and vaguely sullen.

The humanities stand or fall to the degree they infuse the lives of the men that profess and learn them. Yet today the whole structure of higher education increasingly excludes such commitment and concern, and threatens to corrupt the very traditions it was established to preserve.

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*The _Community Development Foundation_ (Boston Post Road, Norwalk, Conn.) has in operation training systems which integrate programmed instruction, video-tape instruction, field work, and computer-assisted evaluation of results. Though other groups also are active in this field, CDF's operational system has demonstrated extraordinarily effective results in preparing people for work in a field that is extremely demanding both of knowledge of specific technologies and of insight and sensitivity in working with individuals who often are suspicious and incommunicative. See also P. Suppes, "The Uses of Computers in Education," _Scientific American_, September 9, 1966.

"At present," in the words of Arrowsmith, "the universities are as uncongenial to teaching as the Mojave Desert to a clutch of Druid priests. If you want to restore a Druid priesthood, you cannot do it by offering prizes for Druid-of-the-year. If you want Druids you must grow forests. There is no other way of setting about it."* The following section names three types of "forests" that might be worthy of further study.

Some Institutional Alternatives

In The Uses of the University, Clark Kerr describes one multiversity:

> The University of California last year had operating expenses from all sources of nearly half a billion dollars...; a total employment of 40,000 people...; operations in over a hundred locations...; nearly 10,000 courses in its catalogues; some form of contact with nearly every industry, nearly every level of government, nearly every person in its region. It will soon have 100,000 students--30,000 of them at the graduate level; yet much less than one third of its expenditures are directly related to teaching.**

Such size and diversification of activities inevitably raises questions as to the proper role and function of the university and the most appropriate "economy of scale" for it to serve this role. Through automated information processing and interfunctionally integrated systems of command and control, large business enterprises have been able to combine the creativity that can come of local autonomy with the massive resources and expertise that can be made available through a large and powerful central directorate. The key question, of course, is who should do what.

In the mechanical phase of industrialism, when capitalists needed "hands," there was no great economic push for massive higher education.

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*W. Arrowsmith, "The Future of Teaching," The Public Interest, Number 6, Winter 1967, pp. 53-67, p. 55.

**Clark Kerr, The Uses of the University (Cambridge, Mass.: Harvard University Press, 1963).

The transformation of an agricultural and immigrant population into an urban industrial one required "adjustment" and this is just what the school system sought to produce. The electronic phase of industrialism, the later post-industrialism, on the other hand, requires something the world has never seen--a mass of intellectuals. This new need already has been reflected in the explosion of higher education. As Bernard Berelson puts it, from 1900 to 1940,

> ...everything in higher education was increasing in size, and far faster than the population of the age group most directly involved. The latter did not even double in these four decades, but institutions offering the doctorate more than tripled, college faculties became five times as large, college enrollments six times, baccalaureate degrees seven times, and graduate enrollments and degrees from thirteen to seventeen times.*

Unlike the expansion of the great business corporations, however, this tremendous growth was neither prophesied nor planned.** The universities simply added spare rooms as the family multiplied. Organizational planning and cost-effectiveness analysis have been employed only recently, and even then only from the viewpoint of making a big organization run more smoothly rather than asking whether bigness itself was of advantage to the purposes of higher learning. This paper does not pretend to such an analysis; but it can affirm that the central function of higher education is to educate its students, first in a general humanist sense and, secondly, as professional specialists. From this assumption, all other activities such as administration, fund-raising, corporate or government contact, and, most importantly, professional research, must be viewed as ancillary, to be preserved and refined if they support the process of teaching, to be curtailed if they obstruct it.

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*B. Berelson, Graduate Education in the United States (New York: McGraw Hill Book Company).

**Clark Kerr, *op. cit.*, asks "How did the multi-versity happen? No man created it; in fact, no man visualized it."

As it is reflected in the power structure of the universities, however, this perspective certainly is not the dominant one. According to Arrowsmith,

> Research is dominant now because teaching has no effective representation, no normalized political place or power, within the structure of the university. The departments are theoretically composed of teachers, or teacher-scholars, but actually they have been wholly captured by the research professoriat. The research scholar has everything--the departments, the powerful committees, the learned societies, the federal funds, the deanships, and the presidencies--and if he chooses to say that he finds teaching distasteful and unworthy, who will say him Nay?*

For humanistic education to be re-established as the central function of the universities, then, requires that the teacher of humanities must have some secure institutional power. The teacher, like the scholar, must have administrative authority, funds, facilities, and students under his own decision. To do less, to simply add a few humanities courses or professorships, is to deny the realities of institutional politics.

The following comments, then, are intended to suggest three broad avenues which might be explored in arranging institutions of higher learning around three basic functions--humanistic education, the central role of the universities and colleges proper; the production of new knowledge through specialized research; and the training of specialized professionals. The first function might be facilitated by radical transformation of the colleges and universities themselves; the second by spinning off research and development activities to special centers and institutes set up for that purpose. The third function might be accommodated through special graduate training centers.

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*W. Arrowsmith, op. cit., p. 65.

1. Humanistic education. In the age of mechanical technology centralized bigness had the great advantage of pooling all information and resources for the most efficient deployment and use. It had the disadvantage, however, of necessitating functional specialization and "bureaucratizing" face-to-face relations which are crucial in the learning process. With electronic technology, however, one can have the advantages of information control and planned resource allocation while still maintaining the more intimate affective environment that is possible only in a smaller social orbit. Viewed in these terms, then, the centralized, "impersonal" multi-versity is not necessary to efficient administration. Moreover, it tends to be obstructive to the teaching process. On the other hand, teaching might be better served by the decentralism and flexibility of multiple small centers, linked electronically to share library resources, administrative, statistical and operating data, and so on. Within a single university, as Michigan State or UCLA, for example, undergraduate colleges could be created with autonomy over budget, curricula, and staff. Also, students, who more than anyone seem to have a vested interest in general education, could be given effective representation and a vote. The central administration of the university would function to service and support the colleges, but within general guidelines, all policy and operating decisions would be made by the colleges themselves.

If the multi-versity tends to be too centralized for effective teaching, the small liberal arts college often is too isolated for either cost-efficient administration or meaningful political leverage. While decrying the pressure from professional graduate schools, all but a few of the small colleges cite as an index of their excellence the percentage of their students who go on to these same graduate schools. While claiming teaching is their first function, the liberal arts colleges compete to hire Ph.D.'s whose sole demonstrated interest or competence lies not in teaching but in research scholarship. The result is that the colleges are fast becoming second-rate competitors to the research-dominated universities, and hardly knowing why.

If the colleges were to organize their own federations, not to outcompete the universities in research, but to support humanist teaching, they might go a long way towards enacting what they profess. An activist federation of small colleges could serve functions similar to those the "multi-versity" could render to autonomous colleges on its campuses--library services, data processing, sharing of administrative overhead, etc. Perhaps more important, such a federation could focus the collective weight of the individual colleges to make the professional graduate schools responsive to _them_, rather than remaining the hand-maiden to professional research.* They might even offer graduate programs of their own, not in any professional specialty, but in the general humanities themselves--a program designed to educate, if not universal men, at least highly cultured citizens.

2. _Specialized research_. The thrust of my argument here is not to downgrade research but to upgrade humanist teaching, which I see as the

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*See A.M. Carter, "University Teaching and Excellence," _Educational Record_, Spring 1966, p. 297, for a well-stated argument to the contrary.

central function of higher education. Higher education *requires* an atmosphere in which Socratic dialogue can flourish, and the college, ideally, is pre-eminently the institution which fosters such an atmosphere. On the other hand, though professional research may be facilitated by such a dialogue, generally it does not depend on it; many research scholars, in fact, complain that functions related to college teaching are a "burden" and that professors who take teaching seriously are "martyrs."

It may even facilitate theoretical innovation and please researchers to separate research and teaching entirely, at least in terms of institutional roles. A professor of law might also teach government in an undergraduate college, for example, and might enjoy testing his theses before a naïve audience. But he does not set college policy by virtue of his professorship in the School of Law. If other disciplines wish to be avowedly professional, let them be openly so. Let the graduate department of sociology *do* specialized research and *train* professional sociologists. But set up an independent *underg*raduate department of sociology (or of social relations or what have you) which defines sociology not as a professional career but as a vehicle for general understanding. If the graduate schools felt the undergraduate students were not sufficiently specialized, that would be *their* problem, not the problem of the students or colleges. Once initial snobbery were overcome, in any case, it is likely that a general grounding in the stimulation of insight and the strategy of discovery eventually would make the undergraduate a better professional than the man who began specializing earlier.

At the same time, research institutes, laboratories, policy study centers and other such intellectual establishments could be set up as a new institutional base for research scholars who are not interested in teaching and therefore are not best suited for a college or university.

3. Professional training. As mentioned above, the graduate schools of various disciplines might be made autonomous of the undergraduate departments handling those disciplines, much as undergraduate departments of biology, chemistry, or zoology are not controlled by the graduate medical schools. This would allow greater flexibility of curricula and teaching methods for the undergraduate programs, and a greater degree of professionalism in graduate training. For example, the Soviets have developed specialized professional training programs in some of their big factories and research stations, much as we have medical schools in our teaching hospitals. Graduate programs in history might be associated with the National Archives, graduate programs in art criticism might be set up in museums. The relationship might work both ways, as in the Soviet Union where any worker who passes a special correspondence course is entitled by law to forty days' free time on full pay, during which he can go to the university, use its libraries and labs, and meet with his tutors.*

Other institutional innovations aimed at professional training might include "elementary schools for grown-ups" in which adults were introduced to new disciplines or knowledge in mid-career. Summer residence academies might be established for refresher courses for practicing professionals. Academic cities might be set up where whole families could learn and play together for several months a year.** Professional schools might be created in connection with specialized research institutes. Even bizarre programs might be fruitful for some purposes, such as a "school of spiritualism" for the mystically inclined, or a "school of hard knocks" for those who feel the affluent life is making them soft. Already, it is estimated that many middle and upper middle class youths would volunteer for Army boot-camp training--just as a personal discipline--if they could do so without joining the Army.

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*L. Bowden, "Learning All Our Lives," in N. Calder, ed., The World in 1984 (Baltimore: Penguin, 1965), pp. 74-75.

**See M. Mead, "Outdoor Recreation in the Context of Emerging American Cultural Values: Background Considerations," Trends in American Living, Outdoor Recreation Resources Review Commission Study Report 22, Washington, 1962.

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The above views may be criticized as negative and separatist. That criticism we can accept. Today the "multi-versity" is tending to become more monolithic and uniform, and the "battle of ideas" that is supposed to take place inside it is becoming more and more difficult to wage. Professional research and training are swamping higher education's function of higher education. Moreover, as we tried to show in the first half of this paper, the forces behind this trend can be expected to rapidly grow stronger in the decades ahead. These forces will in general contribute to making America a finer and fuller civilization. Nonetheless, the theoretical innovation and research and development upon which post-industrial society depends is having a pernicious influence on the very institutions that are its source--the colleges and universities. For professionalism has become the byword, and everything that does not serve professionalism is under increasing pressure to take the back seat. We must have research and development and other intellectual efforts working in the service of the state, of national security, of economic growth. But we also must have institutions that serve a wider purpose, that take man and humanity as their measure. A humane intelligentsia can serve this function, but only if it has an institutional base--colleges and universities--which serve values and humanitas.

During the French Revolution Condorcet wrote:

> There is no limit set to the perfecting of the powers of man. The progress of this perfectibility, henceforth independent of any power that might wish to stop it, has no other limit than the duration of the globe on which nature has placed us.*

Today we have less optimism but perhaps more trust. We virtually have conquered nature, only to be confronted with our own unconquered natures--the irony of "Faustian power." In the process, however, we have moved from the idea of progress to the technique of innovation. Our faith in the future is no longer blind optimism; instead, we take calculated risks.

But in education the time is late, and the need for innovation and risk is greater than elsewhere. The Defense Department, for example, spends perhaps ten times more proportional to its budget on long-range policy planning than does the entire educational system. Yet even more than in weapons systems, decisions made today shape our educational situation and commitments in the 1970's and 1980's. New curricula, new teachers, new school systems, must be created now if they are to affect, from grade one onward, those entering the world of adults from college in 1985, or from professional schools towards the turn of the millenium.

Yet today, there seem to be fewer than half a dozen radical experiments dedicated to testing new conceptions of what college life, and hence adult life, are capable of producing.** Daniel Bell has defined our task as humanizing technocracy and taming the hippies, and he feels the former task will be easier than the latter. To me, however, easier or harder seems not the point, for the hippies have virtually no power while the technocrats are bidding to become a new power elite. A technocratic system will be able to "afford" an apocalyptic fringe group, even digest it as a daily repast. But our future society will be humane only if its new elites are educated to humanist values.

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*Condorcet, Progrès de l'esprit humain, Intro., Epoque I.

**C. Jencks, "The Next Thirty Years in the Colleges," Harper's, October 1961, p. 128.

The National Arts and Humanities Act is now on the books, and its objectives are revolutionary. It ought to be put to revolutionary use--the intensive and passionate study of the future of American education, the experimentation with new curricula, new teaching methods, and new college structures. It ought to be used to break the stranglehold of specialized research departments on general learning, to unwind the tentacles of narrow professionalism from humanist studies, and in general make shouts of outrage and acclaim ring in the halls of higher learning.

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PART SEVEN

DRUGS TO IMPROVE MEMORY AND LEARNING

By

Lottie E. Mackay

TABLE OF CONTENTS

Page

I. Introduction. 7-1

II. The Mechanism of Memory 7-11

Approaches and Techniques of Memory Research. 7-11

Problems in Evaluating Memory Research. 7-12

Memory--A Multi-Stage Process 7-15

The "Memory Molecule" 7-19

The Effect of Learning on the Brain 7-26

III. Experimental Findings on Memory Drugs 7-29

RNA and Its Derivatives as Memory Enhancers 7-29

CNS Stimulants as Memory Enhancers. 7-32

IV. Conclusion. 7-38

V. Annotated Bibliography. 7-44

I. INTRODUCTION

In the past ten to twenty years a vast amount of research has been done in the field of memory and learning. Approaches to the problem range from the behavioral one of the psychologist, through the physiological one of the neurologist and other medical researchers, to the minutely mechanistic one of the molecular biologist. There is an abundance and variety of theories on the nature and mechanism of memory and learning; and there is an almost equal abundance and variety of animal experiments being carried on in support of these theories, and in the search for effective drugs to influence memory and learning. Brief sketches of some typical animal experiments will serve to indicate some of the more commonly used techniques:

A group of rats were trained to choose a given arm of a Y-maze by receiving an electric shock whenever they chose the "wrong" arm. After training, the rats were killed and extracts from their (homogenized) brains were injected intraperitoneally into untrained mice. These mice now showed a considerable preference for the "correct" arm of the maze, which the "donor rats" had been trained to prefer. (52)

Rats placed in a wood chamber with a grid flooring learned that at the sound of a buzzer they must step outside the chamber onto a raised platform in order to escape the electric shock which would follow ten seconds later. Rats treated orally with Cylert half an hour prior to training learned faster than their untreated fellows, and remembered better what they had learned. (39)

Mice were placed on a small platform from which they could step through an opening in a wall into a darkened box; on stepping into this box, however, they received a punishing foot-shock, and were thus taught to stay on the platform. They were able to remember this for at least 24 hours. Those mice subjected to electroconvulsive shock (to the brain) one minute after training forgot their training (retrograde amnesia) although if the electroconvulsive shock was administered three hours after training their memory of the training was not affected. Intraperitoneal injection of the amnesic group with strychnine sulfate lessened the amnesic effect of electroconvulsive shock (administered one minute after training). (38)

A group of goldfish were trained to swim over a barrier from one section of their tank to the other when signalled to do so by a light. The training was accomplished by way of electric shocks passed through the lighted section which the fish could escape by swimming into the dark section. A group of trained fish injected intracranially with a protein systhesis inhibitor immediately after training forgot their training but were otherwise normal. (6)

Laboratory mice were trained to escape electrical shock by choosing the lighted limb of a T-maze. Those previously injected intracranially with a protein synthesis inhibitor remembered their training after three hours as well as did their uninjected colleagues. But six hours later the injected mice had forgotten their training, while the others remembered. (15)

Casual consideration of such experiments might lead to the belief that memory drugs are just around the corner. While there are those in the field who do believe this, many others feel that the road ahead is still tortuous and difficult.

Before proceeding further, it would be helpful to put forward some unequivocal definitions of terms. However, although we think we know just what we mean by "memory" and "learning," even the leading experts in the field have been unable to agree on useful definitions. McGaugh maintains that "our failure to develop acceptable definitions suggests that we do not yet have precise concepts of the processes by which we and the other animals store our experiences" (37). Memory, he suggests, "is in a sense the bridge between the past and the present" (38); it is, behaviorally speaking, "not only the capacity to repeat, it is the capacity to vary" (35). Altman, in his detailed, neurologically oriented book, restricts the term "memory" to "imply storage of individually acquired experience," pointing out that he is excluding such concepts as ancestral, racial, or hereditary memory. Learning, he says "presupposes the storage, coded in some latent but retrievable form, of the programs or central schemata of acquired behavioral responses. The postulated storage entity is referred to as the memory trace, or engram" (7, p. 357). Altman thus seems to be separating "memory" from "learning" by associating the storage aspect with the former, while storage, coding and retrieval are associated with the latter. This is not a generally agreed on or usable distinction and I do not believe it is adhered to as such even by its author. It seems more fruitful and less frustrating to view learning and memory as "but terms which are used to refer to several distinct processes which are involved in the storage of experience and that the several processes vary in their degree of permanence" (37). Again, we must add the feature of retrieval or recall to this "definition."

It seems expedient in the present context to treat memory and learning as essentially one subject; certainly the available data on drugs influencing memory and learning are not nearly specific enough to enable one to differentiate between possible "memory drugs" and "learning drugs."

With the existing variety of theories on the mechanisms of memory and learning it is not surprising that the use of drugs to enhance memory and learning is an area which is at least as controversial. Experts do not agree as to the usefulness and/or desirability of such drugs, nor as to the way in which they act. It has certainly been shown that there are drugs which can facilitate human memory (learning), although whether the effect is a direct one, or is indirectly achieved by increasing the subject's general alertness has not been definitely proved.

The work being done at present does not seem to point to the mass use of "learning drugs" in the immediate future. The necessarily cautious and limited clinical tests have been done under highly controlled conditions and with careful supervision. The best results (and even some of these are not too convincing) have been reported with old people whose remembering abilities had suffered with age, with some mentally ill people, and with children having specific learning problems.

It is the last-mentioned of these which is perhaps of greatest interest. I think it is important, however, to recognize the difference between helping individual children over their learning problems with drugs in conjunction with other therapy and perhaps with a change of environment, and administering these same drugs on a mass scale on the assumption that they will help all the children to learn better.

Some other means by which a normal but slow-learning child's ability (motivation, desire) to learn can be improved are already at our disposal and call for far less drastic methods than mass drug administration. The problems seem to lie in how to apply our knowledge of these means, just as it would lie in how properly to administer learning drugs, even if they were at hand now. It has been shown, for example, that inadequate nutrition can have deleterious effects on a child's ability to learn. Proper nutrition would certainly be a more satisfactory solution to this type of problem than would drugs. While I realize that this solution is not as simple as it sounds, I would like to emphasize that the "learning pill" would not be a simple means either. I am doubtful of the possibilities for its mass distribution (similar to the distribution of birth control pills, which after all is not entirely successful either) until many more years of research have been done on the learning process and its susceptibility to drugs.

Possibly such research may lead to drugs which can not only help a slow learner but upgrade the learning ability of any individual, no matter what his starting point may be. This does not seem indicated by current research, however.

A slightly different and, in some ways perhaps more fruitful, approach to chemical aids to learning is to be found in memory transfer. Dr. Holger Hyden, an eminent Swedish neurobiologist, suggested at a recent symposium on "The Future of the Brain Sciences," that "a way will be found to add orderliness to brain cells of one individual by incorporation of gene material from another....The most direct [method] would be to infect the brain with genes attached to a harmless virus entering the brain from the mucosa of the nose." This is a very sophisticated proposed application of his own and others' positive results in memory transfer research with animals. However, even animal results in memory transfer research are very controversial, and certainly no human tests of this type have yet been made. It might seem feasible, at some time in the future, to take a group of children, for example, whose mathematical abilities are below what they should be, and to administer to them (perhaps by Dr. Hyden's method) genes from "mathematically orderly" individuals and thereby improve their ability to learn math.

In principle, it would seem that this sort of method could be used to "add orderliness to brain cells" of many people in many areas, regardless of the original level or orderliness, although once again an enormous amount of research is required before such an application could be considered.

In preparing this survey of memory drugs I have found it necessary to go into some detail regarding the nature of memory, and the mechanisms by which it is thought to operate. This will allow a better insight into the actual and potential uses of learning drugs. Suggested reading for more detailed background material is listed in Part B of the Annotated Bibliography.

Before proceeding to the body of this discussion, however, I would like to leave the reader with a definite feel for the controversy and divergence of opinions among the experts which exists in this field. I have therefore selected a few quotations all of which were written or spoken in 1967 or 1968 by scientists actively engaged in research in the field of memory and learning.

> "....It is my considered judgment--well, fairly considered--that within 5 to 10 years there will be available a regimen combining psychological and chemical measures that will significantly increase the intelligence of man."* (30)

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*Dr. David Krech, Department of Psychology, University of California, Berkeley (1967-8).

"We are competing with evolution, which has done a pretty good job. The chances of our effecting any improvement are statistically small. Drugs always have side effects. The pharmacology of improvement does not exist."[*] (59)

"Eventually, faults in memory may become as amenable to correction as are many of the physical faults we used to accept as inevitable."[**] (58)

"In the light of our observations, we must, therefore, regretfully conclude that the day that offers a pharmacological remedy for severe memory disorders has not dawned yet."[***] (46)

"Although the time has not yet arrived, it seems likely that in future years our understanding of memory storage will enable us to develop and use chemical therapeutics in dealing with memory pathology, such as in mental retardation, aphasia, and senile dementia. There is justification for the view that this speculation is not optimistic."[****] (36)

"Data on memory improvement in older people are highly controversial and ambiguous. Their brain metabolism is deteriorating, losing neurons. If this procedure can be reversed or arrested, yes. But I think nothing done so far proves this at all."[*****] (16)

"Well, presuming that our basic ideas are true, and that held up over a period of time...we will be able someday to transfer memories, or change the nervous system of human beings in a way that we seem to be able to do it with rats, there will be a few changes, I think, in the educational process....For example, we should be able to do away with the schools fairly well.

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[*] Dr. Samuel Barondes, Department of Psychiatry, Albert Einstein College of Medicine (1967).

[**] Dr. Ewen Cameron, Veterans' Administration Hospital, Albany, N.Y. (1967).

[***] Dr. George A. Talland, Massachusetts General Hospital and Harvard Medical School (1967).

[****] Professor James L. McGaugh, Department of Psychobiology, University of California, Irvine (1967).

[*****] Dr. Samuel Barondes, Department of Psychiatry, Albert Einstein College of Medicine (1967).

And if you could be able to transfer every part of a memory to any human being, then why should you send kids to school, unless you want to keep them away from the parents for a period of time....And certainly at the higher levels, with colleges, you can do away with all these buildings, and the dull lectures, and textbooks, and that sort of thing, and you'd simply have people go to the corner drugstore, and if they wanted to learn Spanish that day, they'd take a pill, or buy a pill, and there would be Spanish I, or Advanced Conversation in Spanish, or something like this---and I don't know that that will ever come; very easily could, though, if some of our ideas are true, and it turns out that you can transfer every part of the memory process, you have to make these assumptions. But, since I won't be around to be contradicted, in the 21ST CENTURY, probably, I don't mind making these rather radical assumptions."* (57)

"Does all of this [research] mean that we will soon be able to substitute an inexpensive get-smart pill for our expensive school enrichment programs? The answer is no, as our...experiments...suggest."** (30)

"It is beginning to seem possible that we could facilitate the recall of memory. The memories that you seem to have forgotten are not available to you, not because the memory is impaired normally, but because something is blocking their recall, something is keeping you from remembering. And we think that much of this has nothing to do with memory, but it is an emotional problem. You cannot remember an event from your childhood because you fear the memory. And obviously here it becomes easy to interfere with the anxiety component of the problem, and to bring back memories to you that seemed lost."

"I think it is unlikely that you will find a pill that will bring back Latin I. It is quite likely that you may be able to buy a pill which will facilitate recall, in general, and perhaps even facilitate recall of some period of your life, like the time that you did take Latin I. But not specifically one thing from that period."*** (56)

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*Dr. James McConnell, University of Michigan (1967).

**Dr. David Krech, Department of Psychology, University of California, Berkeley (1967-8).

***Dr. Sebastian Peter Grossman, University of Chicago (1967).

"As for my personal opinions regarding the general area of memory enhancement/learning facilitation, I am afraid that I am rather pessimistic at the present time. Although there are a considerable number of positive reports [in a recent bibliography on 'chemical transfer of training' which is reasonably up-to-date], the negative ones appear to be equally valid. My feeling is that we have not yet reached the stage of scientific sophistication prerequisite to approaching this problem."* (33)

"As for the probable effect of all this [research] on human learning, we can only speculate. If the information-containing molecules can be produced by synthesis, I do not hesitate to predict that young children may receive by chemical means such information as is required for simple skills. This, of course, would be more important for the mentally deficient than for the normal child which has no difficulty in acquiring these skills. Chemistry may also provide a substitute for some of the environmental stimulation whose absence in the early years of life stunts normal mental development.

"As for higher skills, theoretically, there is no reason why they could not be acquired by chemical means. In practice, however, this would presuppose the synthesis of some tens of millions of code-substances which, according to my present hypothesis, control the flow of nerve impulses in the brain and whose combinations make up the memory code. This is, by no means, impossible, but would require time.

"There is also the ticklish problem of inducing basic attitudes, ideologies or simply likes and dislikes. I am far from advocating anything of the sort and would be distressed if my work is ever put to such use. I do not expect to see it in my life time, but theoretically the thing is possible.

"The time table of all these developments is impossible to establish in advance, but I should not be surprised if half of what I just mentioned is realized before the century is over."** (53)

"I am very skeptical of memory transfer possibilities."*** (16)

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*Professor Roger P. Maickel, Department of Psychology, Indiana University (1968).

**Dr. George Ungar, Professor of Pharmacology, Baylor University College of Medicine (1968).

***Dr. Samuel Barondes, Department of Psychiatry, Albert Einstein College of Medicine (1967).

> "Influence state of mind, yes; control, no, because control means always uniformity and men are unique, they respond in a very special way, one different from another, so that I think the ominous vision of chemical control of men, of populations, is biologically unsound. There will always be individuals who do things in a way which is not the way in which the hypothetical controller would want."* (56)

> "What we suspect we will have [in the 21st century] is a series of fairly specific drugs which will have fairly specific effects on the brain, and therefore on the mind. For example, we may very well have a drug which will enable us to expand, extend or contract the attention span of the individual. Or a drug which will improve the memory capacity of an individual, the learning ability of an individual....In other words, in general, what we call the IQ level, just as we now take our various vitamins and drugs, to improve the function of the liver, or of the heart, so we will take drugs to improve the function of the brain. The brain is no less an organ, physiological organ, than is the liver, or the heart. We will say, 'look, we need a drug which will do thus and thus, because we now know that if we do thus and thus to the brain, our memory will improve.' And the chemist will go into his laboratory, and take out from his shelves, whatever chemicals he needs, synthesize drug compound 685-B-3...and this will go on the market. I see nothing at all improbable about the two sets of pills. One you give to one group of people, and their intellectual capacity goes down, forever. The other you give to another class of people, and their intellectual capacity goes up."** (57)

> "Our research is motivated by a concern for brain-behavior correlations in man. However, we have only just started, and it would be premature to speculate as to the applicability of our findings to such problems as influencing or improving memory or learning capacity in man. It will take us a long time to relate our findings in experimental animals to man, and I would prefer not to generalize at this stage."*** (11)

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*Dr. Joel Elkes, Director of Psychiatry, Johns Hopkins Hospital (1967).

**Dr. David Krech, Department of Psychology, University of California, Berkeley (1967-8).

***Professor Joseph Altman, Department of Psychology, (MIT) (1967).

II. THE MECHANISM OF MEMORY

Approaches and Techniques of Memory Research

One of the difficulties--and at the same time one of the strong points--in trying to understand human memory lies in the multiplicity of approaches by which different groups of scientists are trying to remove or at least decrease our ignorance about it. Although the prime motivation for some of the research involving memory is an empirical search for ways to improve it, the bulk of memory research is oriented towards further elucidation of the memorial mechanism; if, along the way, drugs or other means are found which are of practical use as memory improvers, so much the better. It is true that, given a clear understanding of just how memory works, it should be a short straight line to memory aids; and in that sense of course all memory work is directed towards finding ways to improve human memory.

The various routes by which the problem of memory is being studied can be roughly divided into four categories:

(1) Studies on inhibition of memory. These include lesion studies involving the removal, destruction, inactivation, or severing of certain parts of the brain; chemical blocking of specific (chemical) reactions in the brain, such as inhibition of RNA* synthesis or inhibition of protein synthesis; and a chemical breaking down of macromolecules in the brain.

(2) Study of the effects of transfer of specific biological substances from a trained brain to a "naive" (untrained) one.

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*Throughout this report a few simple and generally understood abbreviations will be used. They are: RNA for ribonucleic acid, DNA for deoxyribonucleic acid, CNS for central nervous system, and ECS for electroconvulsive shock.

(3) Examination of various parts of the brain before and after the act of learning or memorizing.

(4) The use of agents to promote the synthesis within the brain of those molecules which are thought to mediate the memory process; or of agents which in some other way improve the functioning of the memory.

These four approaches are not for the most part treated separately here, as it is more enlightening to view their joint contributions to the various theories of memory mechanism. A brief discussion of the third approach was, however, thought to be helpful and is found at the end of this section. (p. 20)

The fourth approach should of course lead straight to the memory pill. In fact, however, this area of research abounds in pitfalls, doubts and contradictions. These, along with more optimistic aspects, are more fully discussed in a separate section. (p. 23)

Problems in Evaluating Memory Research

The criteria used to evaluate gain or loss of memory represent, at least to the writer, the greatest single obstacle to the production of useful research results. It is easy enough to diagnose loss of short-term memory in a person subjected to shock (electrical or, in some cases, psychological or physical); such victims of retrograde amnesia can tell the researcher that they remember what happened to them up to a certain point in time (at which they received the shock), but not what happened after that. Return of short-term memory can also be ascertained from them by word of mouth. However, when it comes to finding out what and how far back a (non-shocked) person can remember, and whether he can remember more or less after a given treatment, there do not seem to be adequate methods. In testing short- and intermediate-term human memory, numbers, words, or nonsense syllables are most often used; they are variously associated, such as in sequence, groups, or pairs. Random association tests, such as colored lights connected to buttons to be pressed, are also used. But does this type of test really measure the quality of memory which we are interested in preserving and improving? How could one hope to measure any improvement in long-term memory other than by the subjective judgments of the subjects under test? These questions are raised not in criticism of what has been done but in an effort to emphasize the crude criteria by which the results of sometimes very refined research must be judged.

It will be noticed that very little mention is made of the relationship of intelligence to memory in most work of this type. There is one instance of "intelligence-matched" groups being tested with a memory drug; however, the drug was found in this instance not to affect memory (44). Krech (30, 32, 57, 58), who is quoted in the Introduction and in the Conclusion on this subject, appears to use the term IQ rather non-definitively, and even interchangeably with "learning ability." This blurring of definitions does not seem to me to help clarify the relationship of "learning" to "intelligence."

In most memory research the question of intelligence or IQ does not appear to have been taken into consideration except by implication. Perhaps this is because the matter of the absolute significance of the IQ scale appears to be increasingly open to question, so that it may be felt by researchers that an extraneous and additionally confusing parameter need not be added to their evaluations. It would seem, however, that a person's increased ability to learn, by whatever means, must necessarily affect his apparent, and perhaps his "real" intelligence.

Memory work with animals leaves the researcher a good deal more latitude in allowing him to feed dangerous or lethal doses of drugs, tampering with the subjects' intimate brain structures, and killing them after his experiments to determine more closely the effects on the brain. However, in devising criteria for improved memory which can later be translated into human terms, I feel the animal researcher is hardly, if at all, better off than those working with humans. To what extent, when all is said and done, can the learned ability of a goldfish to swim from one compartment to another, or that of a mouse to find his way through a maze, be said to correspond to the type of human learning we are trying to foster? There is no doubt that animal experiments have always been and will contine to be essential forerunners of medical advances, in this field no less than in any other. But I feel that caution must be exercised in translating, for example, improved maze-solving by a mouse into improved learning by a human. This problem is pointed up by Branca (18) in a letter to the writer. His initial efforts in an investigation of "Drug Effects on Acquisition, Performance, Retention" show "effects upon rats but none upon human subjects in what we hope are analogous avoidance learning situations." There is still another difficulty in trying to evaluate both human and animal learning experiments. Namely, the variations in experimental design from one laboratory to another, with changes and modifications introduced along the way of what should be a sequential series of experiments. This sometimes leads to disagreement and confusion which could be avoided by some standardization of techniques and tests used.

Memory--A Multi-Stage Process

The dichotomy of views regarding memory mechanisms is perhaps most clearly brought out by John (29, p. 17) in his discussion of memory as "a thing in a place" and as "a process in a population [of neurons]." Although it was at one time a matter of "choosing up sides" between these possibilities, it is now generally considered that memory is in fact both of these--some say sequentially, some say simultaneously, some say sequentially but overlapping.

The "thing in a place" refers to properties--either chemical or configurational--of what is sometimes hopefully referred to as "the memory molecule." Various types of coding mechanisms have been postulated by which such molecules could store bits of memory. But it must be realized that there is no general agreement as to what constitutes the "memory molecule." Some believe it to be ribonucleic acid (RNA), a close relative of deoxyribonucleic acid (DNA), which has recently been so much in the news as the newly synthesized key to genetics; others believe that brain proteins, synthesized "at the direction of" RNA are the memory coding molecules.

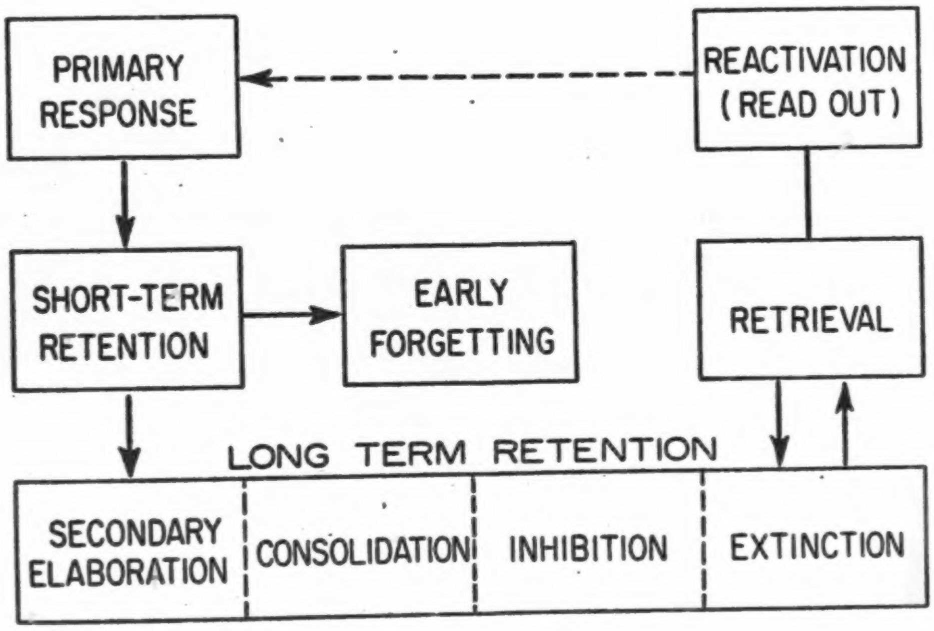
The "process in a population" refers to electrical circuits set up through neurons in response to external stimuli. It is clear that electrical circuits *per se* cannot be the total basis for memory, as they are disrupted by electrical shock treatments, but all memory is not erased by such treatments. The retention of some (long-term) memories and the loss of other (short-term) ones under these conditions gave an early clue to the now universally accepted hypothesis that memory is a multi-stage process. This, however, is where agreement ends, and anywhere from two to six phases of variously stated druation are hypothesized.

John (29, pp. 2-3) lists four fundamental functions of a memory mechanism as 1) the coding of an experience into a neural mechanism, (2) the storage of the neural representation, 3) gaining access to the coded information for the retrieval of specific experiences from storage, and 4) decoding of the retrieved data into neural activity, somehow recreating the "sensations and qualities of the original experience." Cameron presents a helpful schematic diagram (Figure 1) along the same lines, and claims "fairly general agreement" on it. It takes into account the three mechanisms of memory, listed as registration, retention, and reproduction. (54, p. 131) It is, in Cameron's terms, the retention mechanism, and in John's terms the storage of neural representations, which is for the most part the subject of scientific scrutiny and the source of conflicting results in memory studies.

Figure 1

DRAFT OF MEMORIAL MECHANISMS

NOV. 17, 1964


PRIMARY RESPONSE
REACTIVATION (READ OUT)
SHORT-TERM RETENTION
EARLY FORGETTING
RETRIEVAL
LONG TERM RETENTION
SECONDARY ELABORATION
CONSOLIDATION
INHIBITION
EXTINCTION

From studies on goldfish, Agranoff and others identify two stages of memory: 1) short-term memory whose pathways are selected rapidly but impermanently, and which does not require protein synthesis. This stage may continue for several days but cannot be transferred to long-term memory later than an hour following training; and 2) memory consolidation, constituting more permanent pathway connections which involve protein synthesis (2-6, 17, 43). Flexner is essentially in agreement with the above, based on his research using mice (24).

Krech, whose work was done with rats, also describes a two-stage memory storage process: 1) short-term memory, involving the establishment of a "short-lived electrochemical process...in the brain," and 2) long-term memory which is chemical in nature and involves protein production (32). Altman describes short-term memory as "a functional reverberating process," which is followed by long-term memory, "a structural consolidation of the memory trace for long-term preservation" (7, p. 374). John agrees with the above, describing long-term memory as "a long-lasting or stable phase in which experience is stored by means of an organic substrate" (54, p. 136).

Barondes (12, 14, 16, 17) postulates a minimum of three phases of memory storage, based on his studies using mice: 1) an initial, short-term stage lasting only a few minutes; 2) an intermediate phase lasting for several hours or days; and 3) long-term memory storage. He believes these to be overlapping though separate processes, with protein synthesis (RNA-directed) being required for permanent memory consolidation.

Whether an even earlier stage, that of perceiving, experiencing, being stimulated, etc., as well as the final retrieval and "re-creation," should be considered part of "memory" seems to me to be more a semantic than a scientific question. McGaugh, for example, lists a very brief transietn stage as the first of four, thus bringing him essentially into agreement with Barondes who lists only three. McGaugh's concept includes: 1) a highly transient stage, lasting less than a second; 2) short-term memory, lasting perhaps 30 seconds to a minute (exemplified by our remembering correctly for a short time such information as new telephone numbers, street addresses, etc.); 3) intermediate-term memory, lasting several hours (illustrated by our remembering where we parked a car, what plans we have made for the day, etc.); and 4) long-term memory, usually involving extensive repetition (frequently used telephone numbers, for example) (37).

Inglis (28) subscribes to Welford's (55) essential aspects of learning and memory function: 1) perception, 2) short-term storage, 3) evolution of a durable trace, 4) endurance of such a trace, 5) recognition, 6) recall or retrieval, and 7) the use of recalled material. Inglis suggests that short-term storage is made up of two kinds of mechanism which he describes as "a 'p-system' which can only pass information successively; secondly, an 's-system' which can store excess information arriving, for example, when the p-mechanism is already fully occupied in transmitting information from another channel." He supports his hypothesis with some interesting experiments in human "dichotic listening," in which different digits are given simultaneously to each ear of a subject, and the subject is then asked to repeat both digits. One ear, it is suggested, operates under the "p-system," the other under the "s-system."

It is interesting to note that, using a dichotic listening performance test as a criterion of short-term memory, Inglis shows that this function varies with a person's age, increasing in efficiency over the first decade of life, reaching a maximum at about the third, and decreasing thereafter. Inglis' work was done on 240 people ranging in age from five to seventy, and is apparently in agreement with other, perhaps less carefully documented work.

Hydèn (54, p.90) showed that the amount of RNA per cell (he is presumably referring to brain cells) in humans increases up to about age forty, and then decreases.

These rather isolated pieces of work relating age to memory indicate one of the possible routes to the search for memory drugs. As the mechanism of memory becomes more clearly known, the prospects of slowing down such phenomena of aging by way of drugs will of course look brighter.

The "Memory Molecule"

The much treasured concept of an unequivocal "memory molecule" which, once discovered, can help us all remember, learn, and even acquire without "learning," whatever knowledge we wish to possess, must give way to the complex findings of some very sophisticated research. One cannot deny the probable existence of memory molecules, but not in the sense generally envisioned by those who so fondly use the term.

Many leaders in the field are reasonably certain that brain proteins are involved in the consolidation of memory. Among them are Agranoff (4, 5, 6), Barondes (12-16), Flexner (24, 25), Krech (32), McGaugh (36), Ungar (52), Gaito (54, p. 90), and Bonner (54, p. 15[illegible] The specific proteins said to be synthesized in the brain in conjunction with memory are made "under the direction" of "messenger RNA," whose synthesis is in turn directed by DNA. A simple and very clear explanation of this type of process was graphically presented in 1963 in Life Magazine. (See Part B of Bibliography.)

Another school of thought holds that it is RNA rather than protein which is the coding material for memory storage. Its adherents include Plotnikoff (39), Glasky and Simon (27), and Cameron (22 and 54, pp. 137, 146).

Although the protein theory has more adherents and seems to me to have a better basis, the concept of either type of molecule as a memory coding substrate is seen to be at least plausible when their gross chemical structures are considered. Both are long-chain macromolecules whose specific identity (within the species protein or RNA) depends on the order in which the component "building blocks" are arranged. In the case of proteins these building blocks are amino acids; in the case of RNA they are chimical compounds called purines and pyrimidines. Different combinations and permutations of structure and arrangement (configuration) allow the possibility of a great variety of both proteins and RNA's.

Despite this clear possibility and its incorporation in many a respected memory theory, it is interesting to note that John, in his book on "Mechanisms of Memory" has definite reservations about it: "In the writer's opinion, none of the experimental results which have been described is sufficient by itself to warrant the conclusion that stable information storage in the brain is mediated by the structure of macromolecules. Yet, it must be conceded that a wide variety of experimental procedures have yielded an impressive quantity of data strongly pointing toward RNA and protein synthesis as deeply implicated in the functions of memory" (29, p. 124).

Rather than discuss here in greater detail each of the many specific theories of memory mechanism put forward by various people, I have chosen three approaches to the subject for review here. The first two are particularly appealing, clear and concise in concept and in elaboration; both use analogies which seem to me most helpful.

Bonner leads into his molecular biological approach to memory in this way:

> "The act by which the electrical display of short-term memory is converted to long-term permanent memory is clearly the obvious candidate for discussion in terms of chemical change. Let us then go to the encoding of information in permanent memory.
>
> "Information is encoded in the brain in a form much abstracted and symbolized from the original, and it is therefore convenient for our discussion to think of memory in terms of registers, in which information is displayed in binary form. This mode of thinking is almost certainly oversimplified, but it must do until some more sophisticated model comes along. Let us then imagine that we have, in the particular region of the cortex involved, and before the learning process, an empty register, one that contains no information. As a result of the learning process the register is reset. Some information is displayed. The elements of the register are either individual neurons or more probably individual synaptic junctions between neurons. Resetting of an element of the register means that a change in electrical properties of that element have taken place. In the case of the short- and medium-term memories such change is reversible and in fact reversed by time, as well as by electrical activity. In the case of permanent memory the changes in electrical properties associated with the resetting of the unit of the register are permanent ones. The bulk of neuroanatomical evidence leans in the direction of indicating that learning and memory are not associated with the formation of new electrical junctions, not associated with the soldering of the system. To be sure, not all neurophysiologists agree with this point of view, notable Weiss and Hiscoe (1948). For the purposes of our present discussion we think rather in terms of changes in the chemical properties of the neurons involved" (54, pp. 158-59).

Pribram (54, pp. 168-177), in a very clear and plausible discussion, points out that "the results of a new photographic process which produces images by way of a record called a hologram" bear a startling similarity to our perceptual processes. He draws a number of interesting parallels between the two processes in developing his hypothesis of the "neural hologram," then proceeds to elaborate his theory as follows:

> "The properties of the hologram are just those demanded by us to account for ordinary perception. I have already made the suggestion that arrival patterns in the brain constitute wave fronts which by virtue of interference effects can serve as instantaneous analogue cross correlators to produce a variety of moiré-type figures. Now, by means of some recording process analogous to that by which holograms are produced, a storage mechanism derived from such arrival patterns and interference effects can be envisioned. This is possible, since reconstructions of images from holograms have many of the attributes of perceptions.
>
> "I present these analogies advisedly. Only through them can we at this stage of knowledge of brain mechanisms begin to arrive at the "possible." Too long has neurophysiology been restricted to the nerve impulse and its transmissibility at the synapse as the one legitimate function worthy of extensive study. Connectivity and nerve impulse propagation are crucially important in themselves and, as will be seen below, important to the memory problem also. But connectivity and nerve impulse conduction are not enough to handle the richess of behavior and of psychological experience. Nor are they enough to provide a complete understanding of the brain. So, with the reader's indulgence, I will attempt to take the step from the photographic to the neural hologram, before considering more traiditonal memory mechanisms.
>
> "A possible mechanism by which neural holograms are produced suggests itself: Could the conformation of proteins and even longer-range anisotropic orderings of protein structure be altered in one direction during exposure and then later reversed such that, as it were, 'the tape plays backward'? And would this 'drift' in protein memory produce a reverse drift in the synaptically-produced patterns?"

After developing his theory in greater detail, Pribram pulls it together with some observations and analogies:

> "According to the view developed thus far, inputs are both isomorphically recorded as protein-conformation changes and coded into programs through neural growth. These programs, when properly activated, reconstruct the appropriate protein conformation, i.e., the 'memories.' Three observations in addition to the facts of recognition given earlier support the isomorphic recording of input items. One is the occurrence of eidetic imagery; another is the phenomenon of hypnotic regression (Gebhard, 1961); and a final one is the evocation of 'memories' by electrical brain stimulation. . . . The evidence is thus overwhelmingly in favor of the suggestion that, in addition to some memory storage record, memory processing depends heavily on programs. Bartlett (1961) amply documented the view that schemata are stored in the head.

> "In many ways this clarifies the memory problem considerably. If storage were only isomorphic to experience, one should be able to locate and find direct correspondences between all of the stored items and the world 'out there'. In a schematic or programmed memory no such isomorphic relation would have to obtain. The difference is essentially that between, say, a dictionary and a typewriter, between a trigonometry table in a handbook of physics and chemistry and a calculating machine. For example: if I take a simple adding machine and add to it the capability to multiply, I am putting a new memory mechanism into it. If I look into the machine I will find a change and that change may be the addition of a set of registers. Yet I will never find any specific 'product' by opening the machine. 'Products' are obtained when the machine is presented with inputs which 'signal' that a product is required, inputs anismorphic to the 'products' themselves. This seems self-evident enough; but the self-evident is often forgotten in our more erudite arguments about memory.
>
> "Much confusion would be resolved if we adhered to the notion--deceptively simple, yet immensely significant--that 'remembering' is the opposite of 'dismembering.' Even our language relfects that remembering is a putting together, a reconstruction. Once accepted, the conclusion this leads to is remarkable; namely: it means that a good deal of what we call the memory storage problem is a hoax. Most 'memory' is stored in our libraries and in our jobs and homes as inputs to our brain machines. The human organism is thus signalled to remember what he is programmed to remember. But with all this, we must bear in mind that 'remembering is an active not a passive process'."

Pribram goes on to debunk what he calls "the numbers game" with another interesting analogy:

> "Once we dispose of the hoax that isomorphic coding and recording of all inputs is the sole necessity for a 'proper' memory mechanism, we can also get rid of the 'numbers game' that is constantly being played when memory is discussed. Bits of information are thus seen as irrelevancies--every book an author writes can be 'stored' in his typewriter which possesses fewer than 50 symbols on its registers. Now, you can raise the objection that the brain must be more complicated than a typewriter--and I agree; but the number of states that it can register involves an experimental rather than this type of logical or psychological debate. An alphabet of only 26 letters does an heroic job.
>
> "I have repeated these things, which by now are almost truisms, because I find that in our discussions and our literature we do not hold these facts in mind. Over and over, the argument revolves only around storage of particulars. There

> need not be 10^{10} units for storage; there need not be an RNA change specific to a Y-maze but not to a T-maze. The rules of the numbers game hold only if one selects to play it. Only if the model one holds is one based exclusively on item storage--the storage of inputs in some isomorphic manner--is this kind of argument valid. And the evidence is overwhelming that there is more to memory than bit-by-bit storage."

The "numbers game" is just what another serious and prolific memory researcher, Georges Ungar, is evidently playing. In a private communication to the writer (53) he states that, according to his present hypothesis, higher skills could theoretically be acquired "by chemical means," though this would involve "the synthesis of some tens of millions of code-substances"; these, he says, "control the flow of nerve impulses in the brain and [their] combinations make up the memory code."

Ungar's approach to memory research is in the realm of chemical transfer of learned information in mice and rats. (47-52). Ungar has shown that untrained ("naive") mice perform better in animal learning tasks (for example, maze learning, response to a sound, response to an air puff) when injected with brain homogenate or brain extract from mice or rats previously trained in the specific task tested. While there is a great deal of skepticism from many quarters (4, 16, 33, 29, p. 115) about the validity of such chemical transfer, there are also many, sometimes grudging admissions to be found that, despite theoretical objections, the empirical substance of such work as Ungar's cannot be ignored (38, 29, pp. 115, 117, 118). Krech, initially a skeptic, designed some experiments to prove or disprove the possibility of interanimal information transfer (31). In order to make "the strongest possible case for the weakest possible formulation of the transfer proposition" he designed his experiments to show the presence or absence of reinstatement of early memory in rats with the help of brain homogenate from trained rats. Although he states that his findings "neither completely confound the opposition nor overly comfort the true believers," he finishes by cautiously subscribing to "the hypothesis that an homogenate of trained whole brain has within it a compound or compounds which, when injected into a host animal, can act as a memory booster."

John (29, p.118) is one of those who reluctantly gives credence to the memory transfer research done by Ungar, as well as by a growing number of other researchers:

> "Taken as a whole, these experiments seem to provide support for the belief that nervous tissue from trained animals may contain chemical substances which encode information relevant to the learning experience, and that this information may be effectively transferred to other neural tissue by appropriate introduction of these substances. Such a proposition may strike many as extremely improbable, and certainly all evidence offered to support it must be subjected to extremely critical scrutiny. Even if absolute adequacy of technique and data evaluation are presumed, the results are extremely difficult to reconcile with a great variety of considerations. Whether or not future investigations reveal errors in the experimental studies which have thus far been carried out, the increasing effort and interest directed to these studies makes it necessary to evaluate the possible merits of this proposition seriously and objectively."

Ungar himself (51) has proposed "a tentative explanation" which attempts to reconcile chemical transfer with "the accepted idea that the nervous system operates by impulses traveling along specific anatomical pathways." He suggests that "the molecular mechanism intervenes in labeling these pathways and establishing the new connections necessary for the learning process. A peptide* code can readily account for marking the number of neural pathways present in the most complex central nervous system. One can assume that intensive training results in increased synthesis of the code molecules involved in the behavior pattern being learned by the animal. When an extract of brain taken from such a trained animal is administered to a naive recipient the code molecules injected attach themselves to the neurons of the same pathways in which they were located in the donor's brain. This can establish in the recipient the neural connections corresponding to the behavior learned by the donor."

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*Peptides are molecules made up of several amino acids linked together. They can be thought of as juvenile proteins.

Albert, cited in John's book (29, p. 117) suggests that "certain areas of the brain are equipotential, and that the injected molecules need only migrate to certain brain regions.,..On this basis, it is suggested that RNA molecules on which information about the learning experience has been coded may enter the brain and be guided to the appropriate region of the untrained hemisphere by the influence of specific chemical affinities where they somehow function as stored memory."

While these theories do serve to make the memory transfer concept somewhat more palatable, the writer nevertheless feels drawn to Pribram's computer-type concept of memory over any theory calling for some type of recording in the brain of a more or less unlimited number of bits of information, codes, or what have you. This despite the fact that the number of combinations and permutations in structure and configuration of the macromolecules concerned (proteins, RNA) would presumably be sufficient.

The Effect of Learning on the Brain

One of the most fundamental approaches to the question of how memory operates is to study the changes brought about in the brain by its operation. Ultimately, the results of such studies could lead to artificial means (chemical or electrical) of bringing about these same changes--that is, to producing in the brain the end-results of learning or memorizing, without the subject having gone through the normal learning or memorizing processes. However, since this type of research is extremely refined and difficult to carry out it seems to the writer to be the approach least likely to yield direct practical results in the search for external memory aids. It is nevertheless such an interesting and important aspect of memory research that it merits some brief discussion here.

A pioneer and outstanding authority in this area of research is Dr. Holger Hyden, a Swedish scientist at the University of Goteborg. He found, for example, that the brain cells of trained rats contained RNA in greater amounts and of different composition than the untrained controls. (38, p. 9) These findings were confirmed by Zemp in work with mice and goldfish (38, p. 9). Krech (30, 32) working along slightly different lines, studied two groups of rats--one raised in an environmentally impoverished environment, the other in a rat-world "Head Start" atmosphere of intellectual activity and challenge. He found a number of differences in the brains of the two groups, both chemical and physical. Bonner, after reviewing this and other research, states "our model predicts that the learning-induced RNA...should be different from the RNA made in the same cell in the absence of learning" (54, p. 163).

This fundamental and slowly acquired type of information does of course have some practical bearing on the more or less empirical search for memory drugs. Krech and McGaugh (32) point out that the effectiveness of a drug on the chemistry of the brain must necessarily depend on the initially prevailing chemical state of the brain. That is to say, we possibly might find a drug which could help our disadvantaged children learn more effectively but would be of little help to the culturally enriched child. Conversely, we can conceive of a drug which could be used effectively only on the genius to make him even more so. Perhaps another drug could be useful for the aged but not for the young, and still another the reverse of this. These are but the writer's extensions of Krech's conjectures and should be viewed in that light.

Fuller (61) studied the effect on dogs of "experiential deprivation" and found that some of his subjects, on emergence from isolation, performed well in problem-solving tests while others did not. It appears to Fuller that deprivation interfered with the more "vulnerable subjects." He suggests some correspondence of his work with the problems encountered in teaching disadvantaged children. Again, one may speculate that drugs could be found to help these "vulnerable subjects" overcome the effects of their "experiential deprivation." Regardless of whether such drugs were to operate directly on the deprived brain, or, more indirectly, on the deprived whole person, they would in a very real sense be memory and learning enhancers.

III. EXPERIMENTAL FINDINGS ON MEMORY DRUGS

The chemicals which have been experimentally used in attempts to facilitate learning in both animals and humans fall into two categories. One class of chemicals studied includes RNA and its derivatives. Most widely used is another class of drugs which are central nervous system stimulants (also called analeptics) or similar in their effect; among those who claim positive results with these drugs, however, not all attribute these results to the CNS stimulating action of the drugs. Some researchers consider this action incidental and attribute their good results to a specific involvement of the drug in the chemistry of memory.

RNA and Its Derivatives as Memory Enhancers

Based on the widely held conviction (discussed earlier) that RNA synthesis and/or RNA-directed protein synthesis in the brain are intimately connected with the learning process, it was natural that RNA-types of chemicals should be tested as memory drugs.

It should at this juncture be recognized, however, that the memory transfer experiments outlined earlier in this report used animals injected with "naive" brain extract (containing "naive" RNA) to give "base line" information (31, 48). That is to say the assumption was made by these experimenters that "untrained" RNA was not a learning enhancer. Krech, in fact, used two sets of control animals for his "base line," one which was injected with "naive" brain homogenate, and the other which got neither "trained" nor "naive" brain homogenate. By and large he found his two control groups performing similarly, and not as well as the third group (injected with "trained" brain homogenate), though his data are not completely unequivocal. It is obvious, at any rate, that this type of experiment would tend to exclude "ordinary" RNA as a potential memory drug.

In the face of this we must consider results which contradict these. As far back as 1958 Cameron (21) claimed "favorable results" in all 23 aged patients injected intravenously with RNA* and DNA,* with half of the 23 "favorables" further described as "good." The patients were all initially "suffering from impairment of the retention phase of memory." The best of the "good" results were claimed for those "having severe memory deficits and marked confusion." Oral administration of RNA was also tried, but with less satisfactory results. The criteria by which memory improvement was judged were "a counting test; clinical assessment; assessment by relatives; assessment by the social service department." These results, to the best of my knowledge, have not been duplicated anywhere, nor does Cameron himself seem to have followed up his studies. His more recent clinical studies on human memory involve Ribaminol, a discussion of which follows, and Cylert which falls into the CNS stimulant classification covered in the next part of this report.

Late in 1967 Glasky and Simon, whose earlier work was concerned with Cylert as a memory drug (26), announced the development of a new memory enhancer, Ribaminol** (2-hydroxytriethylammonium ribonucleate; that is, a derivative of RNA) (27). They describe rather extensive memory tests using rats; good results are claimed, in all instances for the females, in some (smaller doses) for the males. After satisfying themselves of the drug's non-toxicity they administered it orally to twelve male college students and obtained very marginal results by their own account.

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*Cameron does not specify the source of his RNA and DNA, other than to give the name of a Toronto firm which supplied it. My guess is that it was prepared from yeast, a commonly used source of nucleic acids.

**No information is given on method of preparation. Again, an educated guess would suggest yeast or a similar material as a probable source.

The aforementioned Dr. Cameron was then asked to test Ribaminol on a group of "presenile patients." The test scores are expressed as numbers on a "memory quotient" scale which, it is claimed, "measures one specific aspect of memory, namely, retention." The results showed a statistically significant improvement in the performance of the female patients, the greatest improvement being shown by those with the poorest initial (pre-drug) performance. The male patients showed "marked inihibition of performance enhancement" with Ribaminol. It is conjectured by Glasky and Simon that, in the light of the similar animal results, lower doses can be found to operate optimally in male patients.

The mechanism by which the authors explain the memory enhancing action of Ribaminol is a stimulation of brain protein systhesis. They claim to have shown a 200 - 300% increase in protein synthesis in rat brain by use of Ribaminol. Barondes (16), one of the leading memory mechanism researchers cited earlier, expressed great skepticism of this reasoning in a telephone conversation with the writer, stating that he does not believe that stimulating brain protein synthesis has been shown by anyone (including Glasky and Simon) to improve memory. He pointed out, for example, that his own research shows that even when the brain's protein making capacity is 85% inhibited the memory function remains normal. He feels available evidence suggests that long-term memory storage may, however, involve the synthesis of small amounts of new protein. This presumably would not be stimulated by the more generalized effects of an agent like Ribaminol.

Glasky and Simon do not attempt to explain the difference in effect of Ribaminol on male and female patients, though one would assume that they are presently studying this.

To the best of my knowledge no research, other than Glasky and Simon's, on Ribaminol as a memory enhancer has been published.

CNS Stimulants as Memory Enhancers

A considerable number of CNS stimulant drugs have been tested as memory enhancers, both in animals and in humans. The list is headed by magnesium pemoline (marketed as Cylert by Abbott Laboratories) and includes cyclopropyl pemoline, nicotine, amphetamine, uric acid, picrotoxin, strychnine, pentylenetetrazol, diphenyldiazadamantanol, and probably others. Monamine oxidase inhibitor, a psychic energizer, has also been used. Some of these can be recognized as relatively harmless, or at least tolerated by the human body, while others are definitely toxic or even lethal. This is of course a prime consideration in human clinical testing, though in animal work the lethal nature of a drug is not necessarily a deterrent to its use. It is quite possible, for example, to administer a systemic poison to a group of mice, subject them to before-and-after learning tests, then perhaps kill them to analyze their brain tissue--all before the poison has been in the system long enough to kill the mice.

Cylert, hailed by some as the long-sought memory drug and completely discredited as such by others, appears in fact to lie somewhere in the middle. The most convincing research seems to me to show that Cylert can indeed help the memory process in some situations, but that this is due to its general stimulating effect (i.e. lessening fatigue, increasing awareness, etc.) rather than to a specific involvement in the memory mechanism. Let us look at some of the research, both animal and human, from which the controversy springs.

The principal developers of Cylert at Abbott Laboratories were Plotnikoff who did the original animal work, and Glasky and Simon* who slanted their animal wo. : towards showing that Cylert promotes the synthesis of brain RNA. The clinical studies carried out in cooperation with these men were done by Cameron at the Veterans Administration Hospital in Albany, New York.

Plotnikoff's experiments (39, 40) involved the acquisition and retention of a conditioned avoidance response in rats. In the "jump-out tests," variations of which are frequently used in this type of research, rats are "taught," by way of electric shock applied to the flooring of their cage, to escape into a wooden (shock-free) box. When the "teaching" (conditioning) phase is completed, the length of time the rats take to escape from the (potential or actual) shock cage to the shock-free box is taken as a measure of their learning. Rats treated with Cylert were found to perform better than untreated ones in both the learning phase and the retention (memory) phase of this experiment. Plotnikoff points out that Glasky and Simon's work (26) had shown that Cylert stimulates the formation of RNA polymerase (i.e. of RNA, by extrapolation) in the rat brain, and that there is a likely correlation between this finding and the experiments just outlined. The CNS stimulant quality of Cylert, he says, cannot account for its memory-enhancing qualities, as other CNS stimulants, namely amphetamine, methamphetamine, and methylphenidate were found to be inactive; and since Cylert was used in non-stimulant doses. The lack of unanimity in the scientific world regarding this kind of research is illustrated by objections to Plotnikoff's methodology, raised subsequently by Bowman (42).

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*Glasky and Simon subsequently left Abbott and Illinois State Pediatric Institute, respectively, to join Nucleic Acid Research Institute (Glasky is now its Director of Research) under whose auspices they developed Ribaminol.

Cameron's clinical studies on Cylert (22) were done on "twenty-four patients with severe memory deficits due to senility or presenile psychosis." "Noticeable memory improvement" was claimed for half of these. The criterion for judging the results was the "memory quotient" mentioned earlier, in which 100 is considered roughly normal. Cameron found that only those whose initial memory quotient was at least 60 were helped. Specific improvements in individual patients' memory quotients are cited: from 74 to 89; from 90 to 101; from 67 to 79. While there may well have been noticeable improvement in these patients' memories based on other (perhaps subjective) criteria, I am left quite unconvinced by a 10% to 20% improvement measured on a scale whose precision must surely be open to question.

An undated publicity release from Abbott Laboratories on Cylert (1) states that this drug will be evaluated on larger numbers of patients and on a continuous basis. More data will be sought on its "effect as a performance enhancer, particularly with respect to learning and memory in geriatric patients, brain-damaged individuals, and children with learning disabilities." Its enhancement effect on normal individuals is also being studied. Results of these studies are not available at present.

The only (even limited) support for Cameron's findings comes from Talland at Harvard who rather tellingly entitled his paper, "Improvement of Sustained Attention with Cylert" (45). Talland uses more stringent criteria, and also more specific (less generally applicable?) tests than

Cameron. His subjects were twenty-four college students. His results showed that Cylert had an effect that was "fairly instantaneous, and manifest in an increase of correct responses to a class of visual patterns that were specified as signals, without an increase in false positive responses." Talland concludes that "Cylert is capable of improving performance by human operators, though possibly only by mitigating fatigue effects."

Talland's attempts to help amnesic patients with Cylert (46) were completely negative. He feels that, coupled with his positive results with healthy students, these results further substantiate his view that Cylert acts as a CNS stimulant and not as an RNA-synthesis stimulant (which latter action would be more likely to help the amnesic's memory). Maickel and co-workers (34) feel that their experiments with Cylert-treated rats confirm Talland's views.

Burns and his co-workers at the University of Michigan (20) tested the effects of both Cylert and dextroamphetamine on the learning ability of thirty male students. The test used here was associative in type, calling for the subject to learn which of eight randomly assigned buttons (to be pressed) corresponded to each of eight neon lamps arranged in a row. The results with both drugs tested were completely negative, with the subjects under placebo learning the fastest.

Completely negative results with the use of Cylert were also reported by Smith (44) who tested it on "39 young adult men, with carefully screened medical and psychological backgrounds"; since the research was done at Edgewood Arsenal in Maryland, one may assume they were service men. Tests were made at two dose levels of Cylert, with a third group being given a placebo.

Learning and 24-hour retention were measured by three tests: a verbal learning test which involved memorizing lists of three-letter English words; a motor test which called for maneuvering a stylus through a curved track without touching the sides or bottom, while viewing one's action only with a mirror; and a "classical conditioning of the galvanic skin response," a correlation of a clicking sound through earphones with an electric shock to the finger tips. In no case did Cylert improve the subjects' performance, with any performance differences being somewhat in favor of the placebo group.

Of course, the nature of Burns' and Smith's tests do not correspond to either Talland's or Cameron's criteria. Nor is the sex distribution of Talland's or Cameron's subjects mentioned in their papers. Direct comparison between any two of these reports is therefore somewhat questionable.

Another CNS stimulant, uric acid, was studied by Essman (23) as a memory enhancer. Unlike the other drugs mentioned, uric acid has the distinction of being endogenous to the brain, since it is an ultimate breakdown product of RNA. Essman found that mice injected parenterally with uric acid performed better in a water maze escape test than those injected with saline; furthermore, that those injected with uricase, which decreased the (endogenous) uric acid in the brain, performed worse than the saline-injected animals. He also found that mice which were subjected to electroconvulsive shock after training (thus producing retrograde amnesia) were helped to restore their memories by uric acid injection. He suggests that "either the rate at which the memory trace is consolidated has been increased... by uric acid... or the central effects of cerebral electroshock, which account for the emergence of retrograde amnesia, have been modified by uric acid treatment." Coupling his animal studies with very thorough work on amounts of

RNA, uric acid, and other chemicals in the brain under various conditions, Essman concludes that "the present data suggest the dependency of the memory consolidation process--and its disruption by agents or events like electroconvulsive shock, upon the metabolism of molecules, the functional character of which may itself be prescribed by both molecular and synaptic events."

One may hope that it might be possible to translate some of Essman's findings into human terms, although this seems not to have been done so far.

Perhaps the more impressive cases of successful enhancement of human learning fall in the "gray area" which does not confine itself to the use of drugs alone. Eisenberg and Conners (56) at Johns Hopkins Hospital report that a normal ten-year old boy with poor reading ability (two grade levels too low) and other difficulties in school was helped by amphetamine to improve his schoolwork. This was attributed to the fact that amphetamine "in children seems to calm mental restlessness and lengthen the attention span."

Another case in point is the successful use of monamine oxidase inhibitor, a psychic energizer (anti-depressant) in helping underachieving teenagers. Mandell (57) found that improvement was maintained even after the drug was stopped; it appears that success was achieved by inducing more motivation, a better mood, etc., rather than by direct influence on the learning process as such.

This kind of result, as well as combinations of drug treatment with improved education, improved environment, etc., tends to blur the line between specific drug action and other factors in their effect on memory. This is not to say, of course, that such results are therefore any less desirable than unequivocal drug enhancement.

IV. CONCLUSION

The most realistic conclusion to be drawn for the immediate future would seem to be that the day of the memory pill is not yet at hand. But memory research is an amazingly burgeoning field, both in the practical areas which are more apt to catch the public's imagination, and in the fundamental areas which may now seem abstruse as well as removed by several levels of abstraction from "the real thing," but which are likely in the long run to lead to the truly revolutionary changes in memory manipulation. Memory research is an active and vital field of endeavor, with new information continually pouring forth from universities and industrial laboratories (see references 25 and 60, and the updated Addendum to the Bibliography).

Electrical stimulation of the brain is the subject of at least as much scientific interest as is drug stimulation, and its short- and long-range potentials seem to me to be quite similar to those mentioned above for drugs.

Another subject not touched on in this report is the whole area of "mind-expanding" drugs such as LSD. How closely their effect can be correlated with the memory process is among the many unanswered questions in this field. But it seems likely that as more knowledge is gained about the way LSD operates in the brain, this knowledge will tie in closely with the action of the drugs discussed in this report; and it is likely to contribute to the over-all picture of the mechanism of memory.

Similar considerations hold for studies of sleep, dreams (which must after all involve memory of some kind), "electrosleep," and related subjects. All of these will in the end make their contribution to elucidating the whole picture of how we think, learn and remember.

But neither the fundamental nor the pragmatic approach to chemical or electrical modifications of memory can for the moment rival in practical significance the correlation and combination of drugs (or of electrical stimulation?) with other methods of affecting memory and learning.

There is no doubt that nutrition can affect learning ability (intelligence?), probably in very specific physical ways which will become better defined as the mechanism of memory becomes better understood. At the same time, inadequate nutrition can adversely affect learning ability on a more general level, combined with poorer functioning of other body processes under such conditions.

Along with this we must look at the effect of environment on memory and learning. This also has been and will continue to be the subject of much research. The proper motivation and surroundings for learning are known to be of extreme importance. Depending as they do on interactions among home, school, government, etc., they offer a challenge to scientists and social scientists of all stripes to isolate and define the variables, and combine them for optimal effect. By implication, of course, this last assumes the prior definition of "optimal effect" which is by no means unequivocal.

At this point, it seems to me, the biological and physical scientists leave the center of the stage to the behavioral and social scientists. For it is these latter who must wrestle with the social implications, the ethics and the morals of being able to upgrade human memory and learning.

The choices which must be made will increase sharply as more learning drugs are clinically tested and found to have even limited effectiveness. The possibility of "mind control" becomes very real and in that sense the development of these drugs must be regarded as a part of the "Intrinsically Dangerous Technology" discussed by Kahn and Wiener in Part VIII. Perhaps this point becomes even clearer when it is considered that drugs to hinder certain aspects of learning (block some memories) are perhaps even more likely than learning enhancers to become available quite soon. Will it perhaps be considered "better" for some people to forget some things? It is easy to picture the dilemmas faced by a person (group, body) whose function it is to assign learning pills to some people or groups, "forgetting pills" to others.

In conclusion I have selected quotations from prominent research people in the field of memory drugs which show that they, no less than the social scientist, are concerned about the wider implications of their scientific findings.

> "...I think the 1984 vision is at the moment, from all that we know, a phantasy. Certainly if you regard the chemist, the brain chemist as Big Brother, there is no chance of that.... One of the tragedies of our age is an abdication of personal responsibility to the experts. And we've been through all these experts...everyone has had a crack at this expertise. Don't let's again run amok and say now it's the chemists' turn to control. Agreed, we know a fair amount and I think we'll know more and these drugs are therapeutically very useful. But still...the important cues which man responds to are the social cues--the environmental cues. Life to man is always other people. This is in fact what...man's life is about, other people. And I envision something like this if we are beginning to think in terms of improving human capacity chemically, which is certainly something which we ought to begin to think about seriously. It will go nowhere unless you really do something substantial about the early development, about the school, about all the other social agencies

which play upon the developing human being, and above all, unless you improve social responsibility of, in particular, parents in regard to their children."*(56)

"As an experiment, and with some misgivings...I began to use [on some troubled children and adolescents] various kinds of agents which manipulate substances which are thought to change neuro-hormones, and substances having to do with motivation, mood arousal, activity level, drive, whatever you want to call it....In several cases now, highly suggestive evidence has been that these kids begin to sleep less, begin to become oriented toward achievement, they study and they compete, they are more active....They see themselves as achievers,...teachers expect more from them....Such, that there is a complete kind of psycho-social revolution in some instances, which interestingly enough is maintained after the drug is stopped."** (57)

"I think the limiting factors in learning and education are educational devices and, especially, motivation--by family, and by teachers. This is very low now; students are not extended, not motivated.

"Central nervous system stimulants, arousing agents, alerting agents, etc., could be used to motivate, if that is the choice of society. But there are other equally effective ways. The prospects of using words to control are as much or as little scary as those of using drugs."*** (16)

"I think though we have no means of desirably affecting the learning rate at this time there is every reason to think that we will be able to do something about it. My personal concern is that we do it well; if we decide that this manipulation is feasible, that we do it in ways that are socially acceptable; and in particular I think the current public interest in drug manipulations in this regard is rather over optimistic. My feeling is that we will learn the patterns of environment that optimize learning rather than using drugs for internal manipulation."****(57)

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*Dr. Joel Elkes, Director of Psychiatry, Johns Hopkins Hospital (1967).

**Dr. Arnold Mandell, Department of Psychiatry, UCLA (1967).

***Dr. Samuel Barondes, Department of Psychiatry, Albert Einstein College of Medicine (1967).

****Dr. W. Ross Adey, Brain Research Institute, UCLA (1967).

"The biochemist's work can be only half effective without the educator's help.

"Both the biochemist and the teacher of the future will combine their skills and insights for the educational and intellectual development of the child."* (32)

"I don't believe I am being melodramatic in suggesting that what research in brain chemistry and behavior may discover may carry even more serious implications than the awful--in both senses--achievements of atomic physicists."** (58)

"I am...troubled...by some strangely complex problems of social policy that the positive, successful result of such [biomedical] research may soon raise, problems for which none of us are prepared.

"And it is now clear from our own work [on rats] that the chemical status of the brain, before the introduction of any drug, is partly dependent upon the psychological milieu in which the animal has been living. Therefore,...it seems clear that how a drug, introduced from the outside, will change the brain chemistry and thus affect learning will depend upon the organism's psychological environment.

"Now the most likely development from the research that I have been discussing will undoubtedly produce effective treatment for many of the cultural familial retardates. But if we will be able to raise the IQ's of the cultural familial retardates, how about the 'cultural familial geniuses'? And what about...the 'cultural familial mediocrities'?...What would happen if, through psychochemistry, we raise the IQ level of most people by 20 points? What new demands would this place on our educational facilities and practices? What political changes might such a population bring about? What moral changes? How about religious practices and institutions?

"Perhaps we shall find that with the human being we can raise only the lower IQ's, the higher IQ's being resistant to further improvement.

"...Different drugs may be effective for different kinds of problems. On the human level this means that we may be able, through psychochemistry, to raise verbal abilities in some, arithmetic reasoning in others, artistic abilities in still others. Now, who gets what raised and who decides for whom?"*** (30)

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*Dr. David Krech, Department of Psychology, University of California, Berkeley (1967-8).

**Ibid.

***Ibid.

"The techniques of control are so powerful now, that I think its true that at the moment, we could take any given human being with normal intelligence and change his behavior from whatever it is now into whatever you want it to be....And these techniques work. I'm convinced that they work. The man on the street [should be] interested in these problems, think about them...decide what our world is going to become....It's going to be left by default, a matter of choice on the parts of the people who are working with these techniques, like me. Would you like for me to control the world--and you?"* (57)

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*Dr. James McConnell, University of Michigan (1967).

V. ANNOTATED BIBLIOGRAPHY

The following is an expanded bibliography which is intended to give the reader somewhat more information than is usually contained in a bibliography. The main section, containing specific references to which allusions are made in the text, is followed by a short list of materials suitable for acquiring more general background information than is given in the text.

Wherever possible, the authors listed in the bibliography are further identified by their university or industrial affiliation. In addition, a brief comment or summary is given about most references listed. Those references marked with an asterisk comprise easily readable (as opposed to detailed technical) material suggested for slightly more extensive reading.

A. Specific References

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Addendum To Part A, June, 1968

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2. H. Fraenkel-Conrat, Design and Function at the Threshold of Life: The Viruses, Academic Press, New York, 1962 (112 pages).	Virus Laboratory, University of California, Berkeley. A moderately technical book written for "the educated layman." For the present purpose the chapters on "The Chemical Structure of Proteins" and on "The Chemistry of the Nucleic Acids," which are on pages 19 to 74, are most helpful.
3. (News Item), Science News, 89, p. 187, March 19, 1966.	(3) and (4) give a very rough, sketchy and brief picture of some modern ways of looking at memory.
4. (News Item), New Scientist, Jan. 12, 1967.	

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PART EIGHT

FAUSTIAN POWERS AND HUMAN CHOICES: NEW ISSUES FOR THE EDUCATIONAL SYSTEM

By

Anthony J. Wiener and Herman Kahn

TABLE OF CONTENTS

Page

A. Introduction . . . 8-1

1. Policy Planning Versus Forecasting . . . 8-1
2. Manipulative Rationality . . . 8-3
3. Beyond Productivity . . . 8-6
4. The Partly Post-Productive Society . . . 8-9
5. The Culture of Affluence . . . 8-12
6. Innovation: Progress Toward What? . . . 8-15
7. Success and Its Disadvantages . . . 8-21

B. Types of "Coupling" Between Major Inventions and Society . . . 8-25

1. Industrial Substitution Effect . . . 8-25
2. Pollution or Environmental Hazard Effects . . . 8-27
3. Geographic Effects . . . 8-36
4. Effects on the Way of Life . . . 8-37
5. Demographic Effects . . . 8-44
6. Internal Political Effects . . . 8-45
7. International Effects . . . 8-47
8. Pervasive and Dynamic Effects . . . 8-50
9. Personal Choices with Wide-Ranging Social Effects . . . 8-51

C. The Special Impact of Military Technology . . . 8-58

D. Conclusion . . . 8-62

A. INTRODUCTION

This paper is concerned with some technological and economic prospects, the opportunities and dangers they seem likely to present in the next thirty-three years, the challenges they are likely to pose for understanding of policy choices, and the consequent issues for future educational policy.*

1. Policy Planning Versus Forecasting

It should be noted at the outset that the purpose of speculating about the relatively distant future is not to "predict." A "crystal ball" is impossible; the future does not exist, and is indeterminate in crucial respects. In the usual "forecasting" model, one "looks at" the future," and on the basis of what he "sees," forms expectations, and makes decisions that "change the future." (See Figure A on the following page.)

However, Figure B illustrates a more realistic procedure. The purpose of developing expectations about the more distant future is simply to furnish a better perspective on current trends and tendencies and thus to make decisions that are intended to intervene in these trends, in order

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*This paper is a part of a continuing Hudson Institute project, and will be revised and expanded further. Related publications include Kahn and Wiener, "Faustian Powers and Human Choices: Some 21st Century Technological and Economic Issues," in William R. Ewald, ed., The Next 50 Years: Environment and Change, Indiana University Press (in press); A.J. Wiener, "Faustian Progress," in Richard Kostelanetz, ed., Beyond Left and Right: Radical Thought for Our Time, William Morrow & Co. (in press); Wiener and Kahn, "On 'Studying' the Future Social Effects of Science," in Encyclopedia Britannica Yearbook of Science (in press); and A.J. Wiener, "Science and Technology," in Salvaging the 20th Century, to be published by Esquire Magazine. Parts of this discussion are based upon The Year 2000: A Framework for Speculation on the Next Thirty-Three Years, by Herman Kahn and Anthony J. Wiener, prepared for the Commission on the Year 2000 of the American Academy of Arts and Sciences; published by the Macmillan Company, New York; Copyright © 1967 The Hudson Institute. We are indebted here to Gail Albert for research assistance, and to Max Singer for conceptual contributions.

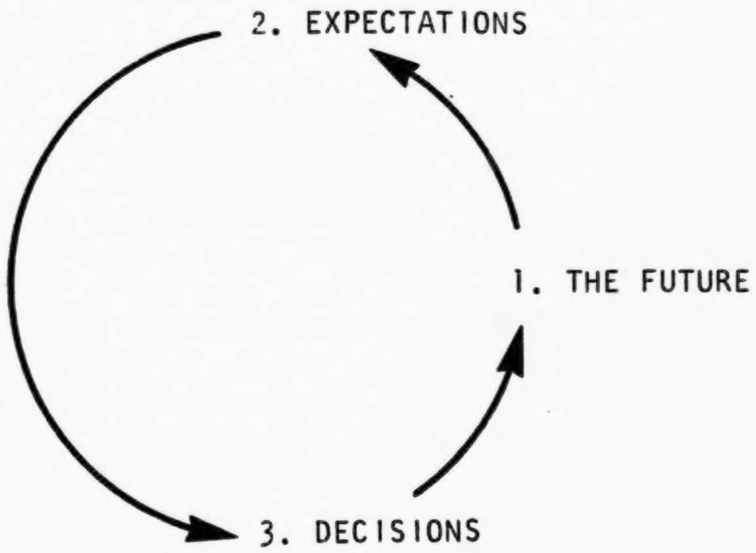
2. EXPECTATIONS
1. THE FUTURE
3. DECISIONS

FIGURE A. CRYSTAL-BALL FORECASTING

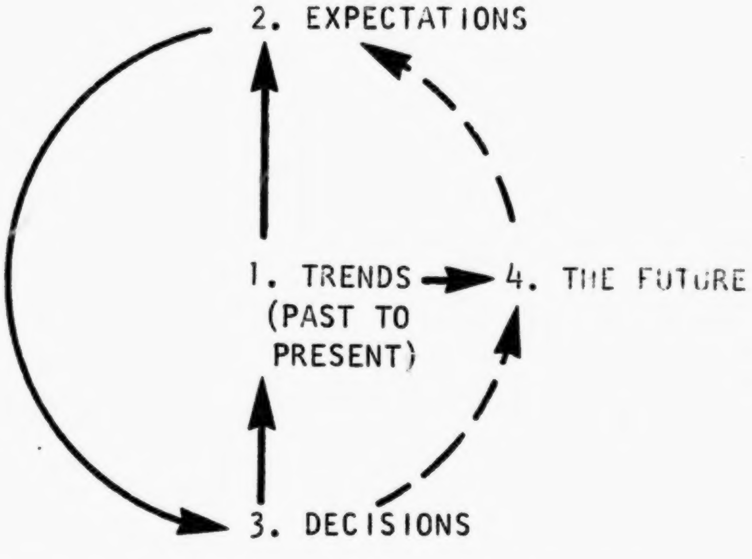
2. EXPECTATIONS
1. TRENDS (PAST TO PRESENT)
4. THE FUTURE
3. DECISIONS

FIGURE B. LONG-RANGE POLICY PLANNING

to make future improvements. Moreover, expectations concerning the future are based, necessarily, on trends that connect the past with the present. Thus trends, and therefore history, play central roles in long-range planning. One must expect many "surprises" in the future, so that a simple continuation of current trends would in itself be extremely surprising. Yet any specific scenario containing particular surprises would be even less plausible. Thus the "design case" for long-range planning is the "surprise-free" projection. This raises the question, "What are the very long-range tendencies that, in the absence of surprises, would probably continue?"

2. Manipulative Rationality

Among the important respects in which modern industrial society has differed, and differs increasingly, from pre-industrial societies are its unprecedented degrees of affluence, its even more extraordinary development of technology, and the institutionalization of secular, "manipulative rationality."

By manipulative rationality we mean the calculated and purposeful alteration and rearrangement of physical objects; of economic, political and social organization; of other people; and even of our selves, in their biological aspects and their psychological aspects.

This manipulation is carried out for various secular purposes. It is the source of institutionalization of change. All things are subject to revision in the interests of these criteria. Research and development are a built-in, continuing process for insuring that change goes on ceaselessly, and it tends to produce an increasing tempo of change. Industrialization and modernization have set in motion a process by which they must spread to the rest of the world. They are, in fact, spreading, with the accompanying disruption of traditional societies and loss of the old values of these societies.

Manipulative rationality is the basis not only of further economic and technological development but of certain typical cultural patterns and ways of life. These basic trends of Western society can be seen as part of a common, complex trend of interacting elements--most of which can be traced back as far as the twelfth or eleventh centuries. For analytic purposes, we have separated them into thirteen rubrics, as follows:

1. Increasingly sensate (empirical, this-worldly, secular, humanistic, pragmatic utilitarian, contractual, epicurean or hedonistic) cultures. This means, in effect, humanistic criteria for innovation and social norms, as opposed to traditional or religiously absolute criteria.
2. Bourgeois (including revisionist communist), bureaucratic, "meritocratic," democratic (and nationalistic?) elites. This means, in effect, decision-making by groups interested in rational calculation of costs and effectiveness, in "sensate" terms, of various alternatives, some of which may be novel.
3. Systematic accumulation of scientific and technological knowledge
4. Institutionalization of change, especially research, development, innovation and diffusion
5. World-wide industrialization and modernization
6. Increasing affluence and (recently) leisure
7. Population growth
8. Urbanization and (soon) the growth of megalopolises
9. Decreasing importance of primary (and recently) secondary occupations
10. Increasing literacy and education
11. Increasing capability for mass destruction
12. Increasing tempo of change
13. Increasing universality of the multifold trend

These processes of change, each facilitating the other, have become routinely--one might even say inexorably--exponentially cumulative. As a result the rate of change itself has also increased exponentially; while it is not likely that many of the changes that are in process will begin to decelerate during the next third of a century, it does seem likely that some of these trends will reach limits at some foreseeable point. Some of these trends present serious issues; indeed some of the problems created by our successes in achieving unprecedented kinds of economic and technological powers may even prove overwhelming. Here we wish to focus on some of the new problems created by our successes in achieving unprecedented kinds of economic and technological powers.*

Increasing affluence results from economic rationality. This leads in turn to increasing leisure, which is one of the economic goods that can be purchased by affluence. The affluence also results in increased permissiveness, alienation, dissidence, and generation gaps. The population explodes as increasing hygiene, medicine and food supply decrease infant mortality. Urbanization is also part of this trend: people converge on centers where the work of industrial society can be performed, and leave agricultural work, which can be performed by a decreasing portion of the population. We are now approaching an advanced and uncomfortable stage of crowding and urban sprawl sometimes called "megalopolization."

Scientific progress is increasingly rapid and increasingly relevant to social and political change. Moreover, there are increasingly strong interrelations of scientific and technological developments with basic and general goals of humanity, the national interest, basic national policies, more specific institutional policies, and basic capacities and institutional constraints such as education, manpower, and the economy.

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*For further discussion of other issues raised by the multifold trend such as detailed projections for the world and 29 individual countries, see The Year 2000, op. cit.

As a result, scientific and technological innovations have become commonplace in today's Western society. The man of today adjusts very quickly to dramatic new developments such as heart transplants, manned orbital flight, computerized fingerprint tracing, and laser surgery. Similarly, he is interested but not greatly surprised to hear that, before the end of this century, he is likely to enjoy three-dimensional movies and television, to take advantage of weather control, and perhaps to be able to choose the sex of unborn babies.

Much of the "literature" of "forecasting" of tomorrow's society concentrates on such specific technological advances. But it is at least equally important, if we are to plan for the problems caused by change, to try to project what are likely to be the social effects of rampant innovation--the effects on man's income level, his work routine, leisure habits, and standards of values.

3. Beyond Productivity

What are some of the social prospects for the 21st century? To begin with, our projections* show that, at the start of the century, per capita income in advanced societies such as the United States, Canada and northwestern Europe should range from $5,000 to $10,000, around three times as high as current levels. (In the extraordinary case of Japan, per capita product may grow by a factor of ten in the next third of a century, bringing the Japanese level close to that of the U.S., which may be a little over $10,000 per capita, in 1965 dollars.)

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*On the basis of the GNP/capita growth rates that have been averaged since the end of World War II. See our book The Year 2000, op. cit., esp. Ch. III.

Such an economy--the kind that Daniel Bell has termed "post-industrial"*--would be dominated by a different range of occupations from those now dominant. Today, the biggest concentration of the work force and of social emphases in most advanced countries is in so-called "secondary" occupations (manufacturing and processing), which in the last century have increasingly supplanted the "primary" pursuits: hunting, fishing, forestry, agriculture, and mining.

Tomorrow, because of production efficiencies, manufactured goods will become progressively cheaper in terms of a family's total income, even as their quality and variety improve. Services, provided by those in third-sector or "tertiary" occupations, will probably consume a larger portion of a family's income. This will be particularly true of services provided by highly trained or especially talented persons who must communicate directly with their clients: doctors, teachers, lawyers, entertainers, writers, artists and the like. Their productivity cannot be increased as much by new technology as can manufacturing, managerial and administrative jobs. The U.S. became, last year, the first economy in the world to employ more people in the service than in the manufacturing sector. The growth in tertiary or service occupations seems likely to be so important that it would suggest a fourth ("quaternary") category ought to be distinguished, consisting of occupations that characteristically render services to persons whose own work is in the service sector--for example, teachers of teachers. It is the growth of the quaternary sector that will be most indicative of the emergence of a "post-industrial" society.

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*See his book, The Reforming of General Education (New York: Columbia University Press, 1966), pp. 301 ff., and his articles on the subject in The Public Interest, Nos. 6 & 7, Winter and Spring 1967. For our own detailed discussion of the post-industrial society, see The Year 2000, op. cit., Chapters IV and V.

What are some of the other probable characteristics of the 21st Century society?

Non-economic incentives, as distinguished from salary and prospects of advancement, will probably become of increasing importance in the choice of a job. By these are meant: the geographical location (note the rush of scientists and engineers to California and to the semi-circle west of Cambridge); availability of good schools; fringe benefits; and the pleasantness or satisfaction of the work.

Computers and related devices will make possible data centers with voluminous information instantly retrievable on individuals as well as public and private organizations. The implications are for increased efficiency of many governmental functions, and for increased threats to the privacy and freedom of individuals, if adequate safeguards are not built in.

A variety of new polling mechanisms will exist that will take rapid readings of the public pulse. This may have the effect of lessening the concentration of decision-making at the top and promoting decision-making by consensus.

The supply and demand market and market-derived criteria will be less important as mechanisms for pricing and distributing goods, since cheap energy and cheap manufacturing methods requiring little labor will make possible so plentiful a supply of consumer products that narrow economic efficiency will seem less important.

4. The Partly Post-Productive Society

This projection of post-industrial or, more accurately, partly post-productive society follows, we would argue, from the manipulative rationality that has shown such singular force in the culture of the West. By contrast, most traditional societies, especially non-literate societies, have through the centuries followed a pattern of life remarkably immune to change. The ritualistic way many societies obtain their daily food supply is as good an example as any of the firm grip of tradition.

At a prescribed season of the year, for example, fishermen may set to work digging out new canoes to replenish the fleet used for the daily catch of fish. New boats are put to sea with ceremonial chants and dances, and the ritual is almost as important to the society as are the canoes themselves. Perhaps, now and then, it has occurred to innovative members of the tribes that there might be better ways to provide the population with food than by paddling out in old-fashioned canoes and using traditional fishing techniques. Perhaps someone has proposed that the standard of living could be increased by building a different kind of boat, or by deploying nets, or even by shifting to agriculture. If such innovations are advanced, they are rarely accepted in traditional societies--or the societies would not remain traditional.

Another example may be seen vividly today in the villages of Vietnam. Some Montagnard tribesmen build their huts in the Thai manner, on stilts, even in mountainous locations where there is no danger of flood. Yet not far away the ethnic Vietnamese build thick, well-insulated huts directly on the ground, in a manner well suited to the cold climate of North China, where they originated and where no floods occur. They continue to build their huts in this style even in places where floods occur, where the climate is very hot, and even when they have seen the well-ventilated and elevated huts of their Montagnard and Thai neighbors. Our own society is not immune to the persistence of traditions that are no longer functional, of course. A parallel example is the building of houses throughout the American South in the English and Dutch "colonial" styles, including their steeply pitched roofs, designed to shed heavy loads of snow.

The skeptical and experimental attitudes of the West are quite different from those of traditional societies, though the difference is only a matter of degree. In the West, at least a significant minority has a much greater willingness to take a critical look at what exists and to make whatever changes seem desirable. It is an attitude that is often applied not simply to economic organization but to everything: to the political and social structure of society and to man's own intimate being.

In the last few centuries, these attributes of Western culture--pragmatic, flexible, secular, humanistic--have become more and more deeply ingrained. Occasionally, contrary tendencies have made themselves felt--tendencies having to do with certain aspects of the Reformation and counter-Reformation, the Puritan era in England and the later Victorian era, as well as 20th Century Stalinist Communism, Nazism, and Fascism. Nevertheless, the basic thrust--toward re-examination and rational change--has persisted to the extent that now the essentially Western approach to life has come to influence almost the entire world.

The elites in Western societies--including those of the industrialized Communist and socialist countries--tend to hold the values that characterized the bourgeoisie as it emerged from the break-up of feudal society: values such as personal and family achievement, financial prudence, hard work, and the drive to re-examine and, if desirable, alter things that now exist.

The transition from the feudal to the bourgeois society meant the fading of the idea of a divinely-ordained social order. Government relations came to be regarded as resting on some form of "social contract" between the people and those holding the reins of power. Human relations underwent an analogous change. Person-to-person commitments were no longer considered to have been made in heaven or fixed by tradition. They became a matter of convenience, subject to re-evaluation and alteration.

From this cultural pattern, and the institutionalization of change, have come a systematic accumulation of scientific and technical knowledge and of material wealth. At the same time, many new problems are presented by these forms of "progress." There is a need for educational systems to take into account the new issues that are likely to be posed by increasing affluence, leisure, and economic and technological power to manipulate the environment. Education designed for and oriented to the problems of early industrialization--problems of scarcity, mobilization of effort, acquisition of technical skills, learning to defer gratification, to be prudent, thrifty, innovative, purposive, disciplined, etc.--is not likely to result in persons well-equipped to deal with what seem likely to become the characteristic issues of post-industrial society: what to do with an abundance of wealth, time, and technological prowess. How to dispose of such resources well is far from self-evident, as this paper will attempt to show.

5. The Culture of Affluence

The technical-economic make-up of the 21st Century society will have a marked effect on the cultural and esthetic life of the community. Though there are likely to be consequences that are entirely without precedent, we suggest that we are likely to witness, in effect, an age similar to the Augustan era of Rome, at the beginning of the Christian era.

By way of illustration, when Augustus came to power, around 30 B.C., the free citizens of Rome had 76 holidays a year. When Nero died, not quite a century later, they had 176. Arnold Toynbee has noted that Rome was beset by a species of technological unemployment. As we indicated earlier, if productivity should increase three to five per cent a year, it is unlikely that the production of goods would increase at the same rate. A good deal of the increase might simply be translated into leisure, which is what happened during the Roman Empire. If so, one could imagine Americans, long bourgeois and conformist, becoming relatively anti-bourgeois and pluralist. In short, leisure and recreation, and the values associated with them, may receive a significant new emphasis. At the same time, the idea that an inclination for hard work is a virtue might be eroded, along with other traditional values.

Many fear that the erosion of the old values might cause massive socio-psychological problems--or might open unprecedented opportunities. For example, John Maynard Keynes wrote in 1930 that, as a result of the capacity for cumulative economic growth, the "economic problem" would be "solved" in perhaps another hundred years. He viewed the prospect with some "dread." The struggle for subsistence has always been man's primary occupation. If it became unnecessary, man would be deprived of his traditional purpose. Keynes questioned whether the ordinary man could make the revolutionary adjustments of habits and instincts he would have to make. Still, the economist discerned great opportunities:

> I see us free, therefore, to return to some of the most sure and certain principles of religion and traditional virtue--that avarice is a vice, that the exaction of usury is a misdemeanor, and the love of money is detestable, that those walk most truly in the paths of virtue and sane wisdom who take least thought for the morrow. We shall once more value ends above means and prefer the good to the useful. We shall honor those who teach us how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things, the lilies of the field who toil not, neither do they spin.*

This is a very old strain in Western society: an ambivalence toward the principles around which lives have been predominantly organized: purposiveness, striving, work, achievement, and material acquisition; looking to the future; making investments; and deferring gratification. These principles have been subject to many attacks--by the early Christians, by Marx and Engels, and now by alienated intellectuals and articulate social dropouts in the United States. We may note that Keynes' reference to the Sermon on the Mount is the same reference that some hippies use to describe themselves, as flowers of the field who toil not. Note too that their rejection of economic rationality and the manipulation of people is in many ways similar. The slogan "War is good business--invest your son" is a bitter but perhaps apt parody of attitudes they perceive in the dominant segment of society.

It would appear that, with growing affluence, values oriented toward work will be increasingly rejected in just this way. By the year 2000 it will be comparatively easy, if the Gross National Product continues to increase as it has since World War II, for an intelligent American to earn the equivalent of $10,000 a year without doing very much. And it will be comparatively easy for someone who is not working at all to subsist without undergoing any real hardship. In a society of plenty, it will hardly seem worthwhile to struggle to make a minor improvement in one's living standard. The Puritan ethic may well become irrelevant to the functioning of the economy.

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*John Maynard Keynes, "Economic Possibilities for Our Grandchildren" (1930), reprinted in Essays in Persuasion (New York: W.W. Norton, 1963), quoting from pp. 371-2.

The type of person associated with it will also tend to disappear. Parents will not be so strongly motivated (this already is happening) to imbue their children with respect for diligence, punctuality, self-denial, or even patience. Or they will try in vain: rapid technological and cultural change itself creates a strain between generations. Most families will be like those of American immigrants, whose children rejected the values of their parents and looked to their peers and to the external society for their standards. The parents found themselves turning to their adolescent children for guidance because the children were closer to the world around them.

A peculiarly American style is likely to characterize the decline of traditional values in the United States. Today's wealthy European can become a playboy, or (to be more generous) indulge in the social activities of a trained, gracious gentleman, without incurring the disrespect of other Europeans. But for a wealthy American, this is much harder. If he has made a fortune, he is expected to continue to work, turn to active philanthropy, or remain active and purposeful in some other ways. His children are expected to do the same, either increasing the fortune or devoting themselves to political and social good works. In short, Americans, much more than Europeans, take Puritan, Calvinist virtues seriously. They may therefore feel a need to express a moralistic rationale for the rejection of these virtues. The rhetoric can already be heard: to be part of the "establishment" or the "power structure" is to sell out to a soulless, machine-like exploiting system. To stay "outside" this society is the only way to maintain one's essentially human qualities: spontaneity, honesty, generosity, and the capacity for empathy and love.

This philosophy of rejection, in turn, may produce another difficulty. Few middle-class persons today feel a strong vocational commitment. Some have careers; most have occupations; others just have jobs. They work only to live. For the dropouts from society (most of whom came from the middle class), work is an occasionally required interruption: it may occasionally be necessary to go to work for a month or two to make enough money to drop out again. Meantime, the upward-mobile poor are adopting the contrary attitudes. They are aspiring to middle-class positions and demanding that work provide dignity as well as income. The poor face a cruel psychological bind, since the prevailing view of the middle class, conveyed to them in all the mass media, is likely to be one of contempt for the very things that persons emerging from a poverty culture are trying to achieve.

6. Innovation: Progress Toward What?

Innovation and discovery inevitably result in a certain amount of disorder. Often the pattern seems clear only in retrospect. At any given moment, our expectations, as well as our activities, appear haphazard, unintegrated, and startlingly incomplete. Yet many innovations are mutually dependent. And there is, in fact, a rather broadly correlated movement taking place in the fields of science and technology. Advances in one area are tied in with or spur advances in other areas. Seemingly isolated discoveries often combine to bring unexpected solutions to particular problems. They can be fitted together to form new wholes that are greater than the sum of the parts or lead to other unexpected innovations.

The unexpected discoveries or applications are called serendipitous.* Effects that combine or interact are called synergistic. Too often we underrate them.

Basic research, by definition, is not directed toward specific practical ends but toward developing understanding of some important phenomenon. Therefore, practical applications that result from basic research are serendipitous. An example is the current treatment of cancer in the human male's prostate gland: it is the outgrowth of basic research studies of the seasonal change in the size of the hedgehog's prostate.

Serendipity frequently occurs in applied research as well. The research is aimed at producing practical results in one area and turns up an application in another area. For instance, the hologram, which is used to produce a three-dimensional image or picture, was invented as the result of applied research that had nothing of the sort in view, but was intended simply to investigate image magnification.

A synergistic "breakthrough" may actually be composed of many layers of interrelated synergisms, each important in its own right. Some will provide new or improved methods of basic scientific research which, in turn, will lead perhaps to truly unpredictable serendipitous innovations.

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*As originally defined, "serendipities" were unexpected and fortunate discoveries found while looking for something else; yet such discoveries need not be beneficial.

A most important example may be the synergism of lasers, holography, and computers--a combination that would permit improved spectroscopic and three-dimensional examination of complex molecules and proteins. The resulting advances in biochemistry, chemistry, and molecular genetics could bring far-reaching improvements in drugs, medicines, vaccines and antigens (substances which stimulate production of antibodies when injected into animal tissue), as well as revolutionary advances in the control of heredity.

In _The Year 2000_,* we listed 100 technical innovations that probably will have occurred by the end of this century, 25 less likely innovations, and 10 far-out possibilities (such as extensive lunar or planetary bases or colonies).

For the most part, the list of 100 technical innovations is a list of physical inventions or improvements, having to do with materials, products, processes, power, and the like. The developments in services that are listed--new educational techniques, more reliable and longer-range weather forecasting--will most probably evolve from material developments, such as new kinds of computers. Some of the innovations are obviously ominous--for example, new and possibly pervasive techniques for surveillance, monitoring, and control of individuals and organizations. (Even so, we can conceive of an overcrowded world in which such techniques would be essential. In any event, we can expect more or less successful countermeasures to be devised.) Many of the innovations may have unexpected bad effects, or at least equivocal effects--a matter that will be expanded on a little later. For instance, extensive and intensive world-wide use of high-altitude cameras for mapping and prospecting could also be extremely useful for inspection functions pursuant to a world-wide nuclear arms control agreement, but might at the same time turn out to be harmful in indirect ways--contaminating the upper atmosphere or increasing spying activities and invasions of personal privacy.

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*_Op_. _cit_., pp. 50-57, 66-117.

While many of the forecast innovations belong in what might be called the "hard technology" class, an imposing number of developments in the social sciences should also be expected. Quasi-systematic solutions to social problems may be found by devising ways to quantify the problems--that is, to reduce them in part to numerical values that can form the basis for calculations. The potential is illustrated in the growing field of operations research, which has reduced many complex problems to a relatively small number of basic situations (or models) for which simple equations have been developed. As with new techniques in education and weather forecasting, operations research can be much more widely used as computer capacity becomes much cheaper and more readily available.

Another likely occurrence--though not, strictly speaking, a technological innovation--is the appearance of new languages. This may involve the development of one or more better-integrated, or multi-national, languages, or such rapid change within an existing language that it will, at the very least, be considered to have entered a new phase. Or there may also be greater differentiation, in which small groups of individuals devise code languages for the purpose of avoiding monitoring, or to set themselves apart from the rest of society.

In connection with examining the criterion problem for scientific progress--that is, the problem of assessing the relative desirability of various scientific developments--it is necessary to address also such issues as the relationship between likely social consequences of various prospective scientific developments and the value of investments intended to facilitate that development. It should be possible to develop distinctions between developments that have important theoretical benefits but have potentially dangerous technological consequences on the one hand, and those that represent social options that it would be on the whole better not to exercise. It may turn out on examination that there are no cases for the latter category; however, the issue must be raised.

Since scientific developments have social consequences primarily as a result of the new technologies they make possible, we will loosely use the word "invention" or "development" as a shorthand for "major scientific discovery or invention" and similar phrases. Indeed such phrases are themselves really shorthand. Such phrases sometimes refer to an invention, sometimes to a scientific advance (or "discovery"), sometimes to an engineering improvement, sometimes to a cluster or a combination of such phenomena and their relation to the technological and economic environment. What is meant is something like a "recognizable package of technological phenomena, usually composed of an interacting group of discoveries and applications."

The nature of the coupling between society and various different major scientific discoveries or inventions may vary significantly from case to case. Consider, for example, the following: television, atomic power, convenient contraceptives, transistors, and "cheap" vertical takeoff airplanes. We shall define a number of categories of coupling between an invention and society. For example, in studying such phenomena it is important to be conscious of the level of aggregation or abstraction one uses. Sometimes one wants to use abstract or conclusionary concepts such as "cheap proteins," and sometimes one wants to talk about relatively specific devices such as the transistor. Television, infomation theory, nuclear energy, and lasers are each concepts at a different level of abstraction. Choosing the appropriate level of abstraction means focusing on certain questions and concealing others. Thus the form of statement tends to influence the nature of the study and the questions raised. For instance, it might be useful to examine a case of "substitution effects" (e.g., nuclear vs. conventional power), a case of "leverage effects" (e.g., the transistor/electronic computer), and a case with "demographic effects" (e.g., contraceptive pills or the intra-uterine device).

The reasons for being interested in the economic and social impact of various major scientific ideas or innovations are quite varied. They include, for example, business decisions, the appropriate allocation of scientific and technical research work, public policy decisions, and the need to respond to any special problems that may be caused for which regulation or protective measures may be required. The logic of each of these needs imposes its own constraints and requirements on the effort to predict in a useful way the future economic and social impact of major scientific discoveries or inventions. In this paper we examine various kinds of interests in the economic and social impact of a range of prospective "inventions" in order to assess some of the new issues they will pose for public policy decisions and for an educational system which must prepare the polity to make and/or to live with such decisions.

7. Success and Its Disadvantages

The purpose of this paper is to focus attention on some of the new problems created by technological and economic progress. Through such progress such issues arise as the accumulation, augmentation, and proliferation of weapons of mass destruction; the loss of privacy and solitude; the increase of governmental and/or private power over individuals; the loss of human scale and perspective and the dehumanization of social life or even of the psycho-biological self; the growth of dangerously vulnerable, deceptive or degradable centralization of administrative or technological systems; the creation of other new capabilities so inherently dangerous as seriously to risk disastrous abuse; and the acceleration of changes that are too rapid or cataclysmic to permit successful adjustment. Perhaps more crucial, choices are posed that are too large, complex, important, uncertain, or comprehensive to be safely left to fallible humans, whether they are acting privately or publicly, individually, or in organizations--choices, however, that become inescapable once these new capabilities have been gained.

The capacities of our culture and institutions to adapt to so much change in so comparatively short a time may be a major question; the stresses in domestic societies and in the international system may not be managed sufficiently by meliorist policies. Since the underdeveloped countries are even further removed in industrial and social life from these new technologies than we are, the cultural shock of their partial adaptation to the new technologies may even be greater for them. While technological progress and change are necessary and positive events, they also can present serious problems if not dealt with intelligently and with understanding and foresight.

To speak, to use tools, to pass learning on to children; to put fire, domestic animals, wind, falling water, and other energy sources to human use; to gather food, fuel, clothing, and seeds for winter; to save, invest, plan, build and innovate in order to decrease dangers and insecurities and to increase the power to change natural things to suit one's purposes; in sum, to subdue Nature, and render her subject to human will--such have been the results, if not always the conscious goals, of centuries of striving. Success would seem to be at hand; as we approach the beginning of the 21st Century, our capacities for and commitment to economic development and technological control over our external and internal environment, as well as the concomitant systematic innovation, application, and diffusion of these capacities, seem to be increasing, and without foreseeable limit.

Clearly it is worthwhile to overcome both the deprivations caused by economic scarcity and the dangers and frustrations caused by impotence before the forces of nature. To increase economic development is to increase the availability of at least some of the things that people need and want. To develop technologically is to increase the capacity to achieve at least some human purposes that are widespread and legitimate. These Promethean accomplishments, though they are mixed blessings, are the results of persistent and concerted effort and intelligence, and on the whole they are occasions for satisfaction. In this case, as in others, it has been desirable to solve old problems in spite of the new problems created by the solution themselves.

We do not intend, then, to view the technological and economic prospects of the next fifty years with alarm, to try to arouse a humanistic (or romantic) reaction against the forces of change, or to argue for a pessimistic assessment of the prospects for human values. We are on the whole optimistic; but we wish to survey the range of problems that are already becoming discernible and that could--if social responses are not adequate--lead to very unhappy results.

While few would now believe that the mere multiplication of productive powers is likely to bring mankind into Utopia, or into anything resembling it, it would be ironic (but not unprecedented) if this multiplication of resources were to create problems too serious for the solutions that those very resources should make feasible. Efforts will doubtlessly be needed to invent and implement ways of coping with the new and unfamiliar problems that will certainly arise. Yet despite best efforts, social policies frequently go wrong.*

There is no suggestion here that research ought to be halted. Rather, its most undesirable consequences should be anticipated and compensated for. The failure to do this may be hazardous not only to society but also to science itself--perhaps a more persuasive argument, for some. For example, technological activities of private industry are responsible for many (inadvertent) social costs or evils, such as air and water pollution, for which legislative remedies are being sought. But the activities are private and largely self-funded, in a society where the ideology supports this in principle. Scientific research that is funded to a considerable extent by government, however, may require only one major disaster to produce tight federal controls that will be counterproductive scientifically and perhaps ineffective as well in terms of political and social consequences. Intelligent planning in advance may forestall imposed planning at a later date.

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*In The Year 2000, op. cit., we explore some of the ways this can happen and some of the things that might permit anticipation of difficulties early enough to cope with them; see especially Chapter X.

The impact of science on society is becoming so great and so immediate that this element of the problem cannot be ignored. It would probably be dangerous to handle this problem through the formulation of specific rules, many of which would likely be mistaken anyway. The best way to avoid the undesirable impact of political concern (especially of the concern of political factions) may be to anticipate some of the synergistic effects of science and to compensate for them early or, alternatively, where assessment is difficult, to slow down applications (rather than to stop research) until the impact can be better assessed.

B. TYPES OF "COUPLING" BETWEEN MAJOR INVENTIONS AND SOCIETY

In this section we shall describe a number of categories of economic and social roles that major inventions may fill. These choices are, of course, tentative, but some such system of categories seems to us to be required for any serious effort to think through the methodology of estimating the economic and social impact of a major invention. The differences among inventions are simply too great for any approach to the problem that deals with all classes of invention simultaneously to be very effective (although of course there will be some generalizations that apply to all types of invention).

While there are many approaches that might be used to classify inventions, we believe it will be most fruitful to categorize directly in terms of the problem under consideration, i.e., long-term economic and social impact. (Our second category here--pollution or hazard--is in some ways more appropriate to a different set of categories, and thus it crosscuts the other categories to some extent.)

It should be noted that no attempt is made to make these categories mutually exclusive; an invention may affect society in more than one way.

1. Industrial Substitution Effect

Some inventions have primarily what could be called an "industrial" impact. That is, their adoption in industry affects an area of productive activity, but does not much affect over-all patterns or consumers. Nuclear power is an example of such an "invention." When nuclear power plants become widespread it will not make much difference to most people. The cost of delivered electricity, particularly to the small consumer, will not be immediately affected. The role of electricity in industry or elsewhere will not be changed appreciably. The basic effects will be limited to industries directly related to nuclear reactors and to coal and other alternative sources of energy, unless the price of power drops so far as to create new markets.

While the basic impact of nuclear power is an industrial substitution effect, nuclear power has a number of byproduct effects and we shall return to it later.

A similar example may be fuel cells for powering automobiles. Automobiles would play essentially the same role in the society and the economy if they (or many of them) were powered by electricity from fuel cells. Cost to the consumer of automobiles would not change very much. The main effect on the public at large would be that fuel-cell cars would produce less noise and atmospheric pollution. In widespread use, of course, these cars might undercut an important market of the petroleum industry, for one, and possibly certain other industries as well--with results that would be valuable to study in terms of a possibly radical readjustment in the use of a natural resource.

In the long run, substitutions may have quantitative consequences that will accumulate until they make important qualitative differences. For example, the simple introduction of transistors as replacements for vacuum tubes, at first a mere substitution, has made possible a transition to new generations of computers, among other things, with vastly augmented capacity. This in turn has widespread social implications, some of which we discuss below.

2. Pollution or Environmental Hazard Effects

The development of some technologies creates hazards or byproduct costs to society. These are primarily nuisances rather than matters of potential life and death for hundreds of millions of people, but nuisances that might grow serious enough to threaten man's individual health or survival, or his general economy, comfort and/or happiness.*

Pollution is one of the effects of technological "progress" most in the news today. We continually read of streams, lakes, and even ocean shores becoming so polluted by the activities of our people, industries and cities that the water sources constitute a hazard and can no longer be used for the benefit of society. We lose sources of drinking water, recreational facilities; serious ecological tolls are taken as fish and wildlife are killed or forced to migrate elsewhere. In recent years we have had to mourn the "death" of Lake Erie by pollution-induced oxygen starvation.** Even in cases where man has made an effort to control the effects of indiscriminate waste disposal, his efforts have been stymied by side effects of other technological advances. For instance, the development of detergents was hailed as a great boon. However, it then became apparent that detergent, unlike ordinary soap which is an organic material, resists bacterial decay. It also contains a great deal of phosphate builder which accumulates in surface waters, subsequently acting as a powerful nutrient for algal "blooms." Modern sewage plants are designed to convert organic matter to inorganic salts which can be safely disposed of in our waterways. However, the algal blooms reconvert the salts to algal organic matter. The algae then die, polluting the waterways and thereby defeating the purpose of the sewage treatment plant.*

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*Long-term pollution hazards are surveyed in a task force report to the Secretary of H.E.W., by Ron M. Linton, _et al_., June 1967.

**Barry Commoner, "Pollution: Time to Face the Consequences," _Think_, May-June, 1968, p. 25.

Other objects of our progress have caused a disposal problem too, either directly or indirectly. For instance, our roads have been cumulatively marred by automobile graveyards. The substitution of aluminum for steel in beer and soda cans makes possible the pull-top, but it creates an object that will last, by the roadside or in the woods, for a matter of decades, rather than a few years. The no-deposit, no-return glass bottle represents another significant increase in litter made economical by the affluence of purchasers, who can no longer be induced in large numbers to take the trouble to return bottles for a few cents each, and by a legal situation which makes it possible for the bottlers and the consumers to shift the resulting costs of litter disposal to the general public.

We might also note that waste heat, while not greatly publicized, may become an important pollution problem. There are nuclear power plants and even commercial steam plants which give off enough heat to raise at least the local temperature of a river such as the Colorado by several degrees. As the number and capacity of power plants increase, the issue of heating these rivers can become quite important. Similarly, in large urban areas the temperature generally runs 5, 10, or more degrees higher than in the surrounding rural areas, largely but not completely because of the rejection of heat from man's urban activities. It seems likely that as urban life becomes more affluent, larger in area, possibly more dense and more dependent on energy-consuming (and therefore energy-rejecting) devices, this problem will increase in importance. (For example, the air conditioning for an apartment house rejects much more heat to the outside world than is removed from inside the house, because of inefficiency.)

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*Ibid., pp. 24-25.

A third type of pollution is noise. Automotive vehicles have polluted not only the air in our cities, but also have raised the noise levels, often to points of discomfort. Medical and scientific studies have been made of the effects of higher-than-normal exposure to noise levels to which teenagers expose themselves by means of blaring-loud music; the results have proved to be damaging to some extent, depending upon the exposure.*

A final and obvious example of this kind of pollution is the sonic boom that would be produced by supersonic jet transports.** Some proponents of the SST expect that the difficulty will be alleviated by more efficient aircraft design and/or special operating procedures. But this remains an open question and most experts believe the "boom" constitutes a very serious problem. It has been suggested that supersonic transportation may have to be restricted to routes over water or other uninhabited areas and that, even in that case, shock waves might be excessively disturbing to ships at sea or to other aircraft, not to mention possible unforeseen effects upon sea life.

There are other special activities, some of which are not widely publicized, which can cause serious problems. Some experts feel that the burning of gasoline in the upper atmosphere by high-altitude jets may trigger odd and possibly dangerous reactions in a zone of many delicately balanced processes and delicately stabilized situations.

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*The New York Times, January 13, 1968, p. 14.

**For further discussion of supersonic transport and the possible problems it will create, see the following: Donnell W. Dutton, Preliminary Studies of a Supersonic Business Jet, Society of Automotive Engineers, Inc. #670246; International Civil Aviation Organization, The Technical, Economic and Social Consequences of the Introduction into Commercial Service of Supersonic Aircraft: A Preliminary Study, Document #8087-C/925, August 1960; Lockheed Horizons, Autumn 1965; and Lockheed Horizons, fifth issue.

The contamination or degradation of the environment does not necessarily have to be gradual or local. In a nuclear war (or even nuclear testing), it could be both spectacular and multi-national, or perhaps affect the entire planet. Bacteriological and chemical substances are not only dangerous as potential weapons, although they have within recent years been shown to have serious effects. For instance it appears to be an established fact that whole villages of people succumbed to poison gas attacks in Yemen* and, more recently, there has been grave concern about the possible long-term ecological effects of our defoliation of Vietnamese lands.**

Widespread damage might also occur as the result of an accidentally produced but uncontrollable epidemic. The death of several hundred sheep in the neighborhood of an Army testing site in Utah in the spring of 1968, later acknowledged to be caused by a nerve gas the Army was testing, may be indicative.***

In this connection we must also mention an issue which has received much publicity and which we would argue has probably been exaggerated in discussion--at least as far as conditions of today are concerned--viz., the use of chemicals and other artificial additives at various places in the food production chain. Of course, while there may have been excessive apprehension about this issue in the past, conditions could clearly get a great deal worse, and probably would, if it were not for such campaigns of "exaggeration." The year 2000 may see not only the presence of harmful additives but a sacrifice of taste and of other aesthetic qualities to increased economic efficiency. This has already happened in the United States where commercial fruits and vegetables are inferior in taste to those which once were available (and still are in parts of Europe). However, the decreasing importance of economic efficiency* lends some hope that such trends might be reversed.

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*The New York Times, July 28, 1967, pp. 1, 9.

**New Scientist, Vol. 38, No. 601, 13 June 1968, pp. 583-4.

***The New York Times, April 11, 1968, p. 52.

Several much-publicized projects, most of them government sponsored, have been subjects of controversy in recent years because of their real or alleged degrading effects. Project West Ford was the name given to a Lincoln Laboratory (MIT) project which placed in continuous orbit around the earth a belt consisting of some 480 million very fine dipoles, each about .001 inch in diameter (this is about one-third the diameter of the average human hair) and about 1.5 cm. long. There were two major objectives in this configuration of a "reflector" for radio communication: (1) it would be substantially indestructible by enemy action, and could therefore provide reliable communication in a wartime environment, and (2) by providing a continuous belt which would appear stationary if placed in the equatorial plane in a circular orbit, it would have substantially eliminated certain difficult antenna tracking problems involved in other systems of communication by satellites in relatively low orbits. Much of the controversy surrounding this project came from those who feared the belt would interfere with optical and radio astronomical observations by reflecting man-made radio signals or solar rays. Actually, no such interference is known to have occurred to any significant degree. Others feared that once in orbit, the dipoles would be irretrievable and might interfere with some future and yet unknown scientific observation. For this latter reason the dipoles were so orbited as virtually to assure that they would return to earth within about three years.* The major fear relating to this project, once the initial fears were assuaged, was that if it were successful, a proliferation of dipole belts would occur which, by their very number, might sometime interfere with scientific enterprise.

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*See The Year 2000, op. cit., Chapter IV.

Starfish was the explosion of a 1.4-megaton nuclear device in the van Allen belt, in 1963, in order to study the effects of what was expected to be--and probably was, we hope--a temporary disruption in the belt, which screens off significant portions of solar radiation. Fears were widely expressed, and to some extent remain, that such an experiment could cause a permanent change in weather or radio communications.

Stormfury was a joint Weather Bureau and Navy Project Series designed to obtain scientific data on the structure and nature of hurricanes and tropical storms and to tame them if possible. Several experiments have been undertaken for this purpose including one which bombarded the central force of a storm with silver iodide crystals which, it was hoped, would set off self-destructive forces within the storm center. Other experiments attempted to alter the structure of the storm by seeding rings of clouds at some distance outside its "eye."**

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*I.I. Shapiro, "Last of the West Ford Dipoles," Science, Vol. 154, No. 3755, 16 December 1966, pp. 1445-1448. For further discussion, see also Proc. IEEE, Special Issue on Project West Ford, Vol. 52, No. 5, 1964.

**The New York Times, July 1, 1965, p. 11.

A great deal of controversy ensued after the announcement of these projects, mainly evidencing concern that man's interference might intensify rather than pacify a storm. The Stormfury projects have therefore been limited to storms which are more than 36 hours "away" from any populated areas.* But consider not only the potential dangers of storm-altering capabilities if they were to get into the hands of irresponsible persons or governments with malevolent intent, but the legal and moral dilemmas that will arise regularly for an agency that has the power to shift--or to refrain from shifting--the path of a storm. For example, what kind of tradeoff between lives and property will be in effect?

The "artificial moon" concept of the U.S. Defense Department's Project Able involved the orbiting of a giant reflector that would catch the sun's rays and bounce them back to a predetermined point on earth (in this case the jungles of Vietnam at night), thereby transforming night into day. Astronomers registered loud objections to the project, claiming that it would hamper their observations. After studying the proposal, a committee of the Space Science Board of the National Academy of Sciences reported that it saw "no scientific value in a satellite reflector system that is in any way commensurate with the costs and nuisance to science of such a system." Beyond the effects on science itself, the committee discussed the possible adverse effects that an artificially prolonged day might have on those plants and animals whose life cycles are regulated by the natural passing of day into night.* On the strength of these and possibly other objections, the government decided not to pursue the project for the moment.

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*The New York Times, August 14, 1966, p. [illegible]. See also Thomas F. Malone, "Weather Modification: Implications of the New Horizons in Research," Science, 19 May 1967.

Similarly, any big project which significantly alters the shape of the terrain or the physical landscape can have harmful unanticipated effects. For instance, in the Great Lakes region of the United States, the construction of a canal in 1932 is still having adverse effects. The canal, built between Lakes Ontario and Erie, inadvertently permitted the parasitic sea lamprey to enter all of the Great Lakes where it preyed upon other fish. Trout, blue pike, whitefish and other fish species having all but disappeared from the lakes, another relatively useless species has proliferated to the extent that it has become a nuisance, congregating near shore, clogging water intakes, and often dying and littering the beaches. Only now is the situation being brought under control, and that only by chemical warfare against the lamprey.**

Other examples of far-reaching effects of man's hand upon the terrain can be noted when dams are built, inundating previously dry land. One case of particular interest occurred in the tropical areas of the Surinam River.*** The problems encountered ranged from the creation of swampy shore zones which could give rise to "the development of insect life and problems of public health" to an oxygen shortage in the waters caused by decaying plant matter and leading to the death of countless fish. Certain kinds of weeds may begin to grow in such an area or spread beyond control, playing havoc with navigation and the remaining fish life. The possible ecological problems of such a project can be enormous.

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*The New York Times, May 26, 1967, p. 4.

**The New York Times, January 1, 1967, S.IV, p. 7; Science News, July 1, 1967, p. 9.

***See Dr. J. van der Heide, The Research on a Storage Lake in Surinam, typescript copy of a translation of a copy of "Het stuwmeeronderzoek in Suriname," which appeared in Tijdschrift van het Koninklijk Nederlandsch Aardrijkskundig Genootschap, Vol. LXXXIII, Nr. 2, 1966.

A recent example of possible consequences of this sort took place in Colorado where the Army had been pumping radioactive waste water into a deep well for several years, only to find a marked increase in earth tremor activity in that area. It is suspected that either the weight of the water caused a sudden subsidence of the underlying rock or that the water worked its way into a crack leading to an unstable situation at some great depth.*

The oil tanker Torrey Canyon, with a gross displacement of 120,000 tons, recently caused well-publicized difficulties in the English Channel. Today, 300,000-ton tankers are already being built, 500,000-ton tanker orders are being negotiated, and people have begun talk about 1,000,000-ton tankers.** Similarly, people are building planes of 500,000 pounds gross weight and soon we will be talking about 1,000,000-pound planes. A crash by such a plane in a city would cause immense damage--as well as killing and injuring 500 to 1,000 passengers. Similarly, consider the consequences of a collision between two of these huge planes. In general, enterprises or devices of "excessively" large size are likely to be created in the future. Most will be successful and safe, but at times things will go wrong; the effects will undoubtedly be large and catastrophic.

The "pollution" or environmental hazard problem with respect to new inventions is one for which the government has special responsibilities. Response to such hazards or "insults" to society may be in the nature of regulation, or it may be scientific and technical work designed to reduce or eliminate the hazard or pollution. But before steps can be taken, the danger must be seen, and before they can be effective, the danger must be understood. This is a two-way problem. Some developments which would otherwise result in unfortunate side effects can be made useful to society earlier and more effectively if there is enough understanding to put the dangers in perspective and to deal with or design around them. In other cases, an invention may be put into use too soon without adequate care because the hazards or pollution aspects were not appreciated early enough. Inventions now in the laboratory stage may create unforeseen problems of their own; to cite a trivial instance, what is to be done with the salt from desalinization plants?

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*The New York Times, March 8, 1968, p. 53.

**See The New York Times, January 1, 1967, and "Tankers Move the Oil that Moves the World," Fortune, September 1967, pp. 80 ff.

This is one area of impact where the details of the technology do obviously make a difference, and where intelligent anticipation may be of great practical value. Advance recognition of a potential hazard may permit sensible countermeasures to be taken while it is still relatively inexpensive to do so, e.g., before designs are frozen. For example, just recently it was announced that the much-feared sonic boom effect of the SST may be alleviated sufficiently by recent research done on economically feasible redesign of the engine.*

3. Geographic Effects

The automobile, of course, is the most familiar recent "map-changing" development. It was the key to such enormous social change as the shift to suburban living, and to the development of megalopolis, with, of course, profound effects on almost all aspects of individual, every-day life and on the life of the community. The order of magnitude increase in mobility it offered may, for instance, have been the greatest single factor in the increased homogeneity of a population having vastly disparate regional and ethnic origins.

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*The Wall Street Journal, June 28, 1968, p. 9.

A hypothetical "cheap" vertical-takeoff airplane might in the future have a profound effect on human geography and the pattern of human activity, although it does not seem likely to have as big an impact as the automobile (especially in this country).

A number of inventions that do not directly affect transportation can indirectly influence the geographic distribution of human activity. For example, the shift of people from factory to office that results in part from automation can have such an effect.

4. Effects on the Way of Life

We have probably not yet appreciated or felt the degree to which television will change our way of life. People are beginning to find effects of television in the basic perceptions of young children and in the ways in which they learn as well as entertain themselves. With the recent rise in domestic violence in this country there has been much talk about the influence of violence as projected by the mass media upon the attitudes and habits of our population. For example, Dr. and Mrs. Bruce Welch, both brain chemists, reported recently that the mere witnessing of a fight by a group of mice caused them to display aggressive behavior.*

More directly, political effects are beginning to make themselves felt: certainly the political campaign has undergone a revolution in the quality of the public participation it now evokes, with possibly serious implications for the nature of candidacy for public office, and beyond this, perhaps for the elective process itself. And certainly television has had at least some influence on the currently evolving expressions of responsibility to the public on the part of its leaders and representatives. The impact on international politics of television is still one largely in the future, but it is already evident that the world-wide, close-up observation of events, such as wars, demonstrations, and major speeches, by people in all countries, will ultimately influence the relationships among countries and peoples.

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*The New York Times, July 11, 1968, p. 41.

The development of the laser may make possible much cheaper transmission of information. "Light pipes" over which modulated signals in the optical part of the electromagnetic spectrum are transmitted seem likely to make much greater bandwidth cheaply available. (To be sure, this development is some years away and depends on the development of much new equipment for signal processing and handling.) The television set may have led to an order of magnitude increase in the volume of information, persuasion, and exhortation that can be conveniently channeled into people's houses and brought into their lives. The use of "light pipes"* and associated equipment might result in again as great an increase in the amount of information that can be sent into, and out of, people's homes and lives. Presumably then this new increase in the flow of information will have social and political effects comparable to that of television, or perhaps even greater.

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*Which could be installed with roughly the same degree of ease as wires.

Several types of possible impact from a major increase in the mass flow of information comes to mind. First, such a development may be significant for the political control of large populations. Perhaps there is some predictive value in the fact that such new nightmare "Utopias" as _Brave New World_ and _1984_--and a great many of the future worlds depicted in current science fiction--depend upon the manipulation made possible by the various new devices for transmitting massive floods of information, for their unprecedentedly efficient methods of social control. It was recently reported that "within 5 to 10 years, science will be able to exercise a 'significant degree of control' over human intellectual capacities" biochemically and environmentally* or even electrochemically.

As communications technology advances, the role of face-to-face contact between and among people may be significantly reduced. Devices like the two-way television-phone and similar substitutes for on-the-scene conversation and observation may have as much impact on business travel as the telephone has had on the business letter. (Notice that if this type of development were carried far enough it might become a "map-changing" invention.) On the other hand, advances in communication such as the telegraph, telephone, radio, and television seem to have stimulated interdependence and increased transportation for the purpose of face-to-face communication. Contrary to much speculation, then, future developments such as the picture-phone and the facsimile reproducer may actually _increase_ both business and personal travel more than they will substitute for it. Factors such as the adequacy or overloading of future transportation systems may be dominant in determining the effects of related systems such as communication.

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*_The New York Times_, April 3, 1968, p. 32.

Urbanization--that is, the loss of rural areas, wild areas and the like, and their replacement by city streets and buildings--is considered by many a serious loss, particularly if this urbanization swallows up especially attractive natural areas. Crowding, stress, and other aspects of high-density living are often frustrating and debilitating. Although people are usually gregarious and tend to congregate together in towns and cities for very good reasons, most human beings also seem to like and need space and privacy, at least part of the time.

Privacy is a right upon which people in this country place a great deal of value, and technology which threatens this right would have a far-reaching impact upon our way of life. It is a complex issue which can involve such things as the right to idiosyncratic thoughts, utterances, values, way of life, style and manners, and methods of self-expression. It involves isolation or protection from selected aspects of the physical and/or social environment, selected aspects of the social environment as well as from the many pressures and/or other intrusions by individuals, organized private groups and businesses, and political and governmental organizations.* It provides the right to withhold information, make family and personal decisions, and especially to be oneself. And it allows for enough elbow room to be unobserved occasionally, for aesthetic purposes, to get things done, and just simply as a value in its own right.

There are tremendous possibilities for invasion of privacy, as a result of our new abilities to record, accumulate, store, retrieve data through computerized capacities. Such systems may be very efficient and very useful for public administration and for many corporations, but the availability of the information creates a tremendous potential for the accumulation of dossiers and for the invasion of the privacy of particular people.

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*See, e.g., David Whitlock, "Paging an Erring Motorist," New Scientist, 18 May 1967.

It is already true, for example, that there is a deficiency in the development of due process with respect to computerized data banks. For example, it is now possible, if it has not already happened, that a man in New York may be unable to get a mortgage because ten years ago in California he is alleged not to have paid his bills to the Book-of-the-Month Club. There is in the files of the credit agency "unevaluated derogatory information." He is not able to confront his accusers; he is not able to rectify the data; he is not even given the reason for the action against him.

A Commission to the Budget Bureau has recommended the creation of a National Data Bank, clearly a very useful thing. What it will do is to keep up-to-date federal statistics from all agencies, centrally located. This means information about each individual would have to be coded and sent into the data bank on a continuing basis. If there is a way of going from the individual into the data bank, there is a way of going from the data bank back to the identity of the individual, even when some precautions are taken to conceal his identity.*

This means if there are people with sufficient malice and sufficient ingenuity, they will gain access, they will be able to use the material against individuals. A government perhaps overly concerned with the needs for social control would also find such a data bank very useful. One of the reasons why wiretapping has not been done more than it has is that it is a very expensive procedure. It requires people to listen. But computers could monitor conversations, perhaps thousands at one time, and they could be programmed to respond to key words. What the key words are that would call attention to a particular conversation would depend very much on the judgment of the officials involved.

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*For additional discussion of such a data bank, see The New York Times, January 17, 1968, pp. 1, 52.

Thus, advances in technology can provide new means for crime prevention and solution. Devices which might have the capability for, say, recording and storing all long-distance telephone conversations, or keeping the location of every car pinpointed, are within the realm of possibility. Likewise, it may someday be possible to trace the flow of monies through every business transaction in which they played a part.*

Officials might begin by keying a computer to underworld jargon. Anybody who says "heist" or "stick-up" or some such word would draw official attention to the conversation he was having. But they could go beyond this: they could program the computers to respond to other words, such as perhaps "system," "establishment," "power structure," "confrontation," or even "movement." Such jargon could call attention to a politically significant conversation, or "meaningful dialogue." There are many similar possibilities.

Other devices whose function would be invasion of privacy, such as long-range microphones, very small concealed listening devices or cameras, etc., will also be significant in this realm. And while the average citizen need not fear for the results of such surveillance, it would undoubtedly invade his privacy and alter his attitudes and his way of living and speaking.

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*See The New York Times, November 12, 1967, p. 56.

To the extent that society grows more vulnerable to disruption, there would be increasing pressures for this kind of quasi-benevolent social control. The "system" will try to prevent its own destruction, and most people will not want their society destroyed or even disturbed.

Medical technology will surely sustain multitudinous effects upon our way of life. Some of these effects, such as increased longevity, will affect most of us. Others will affect just a select few, but that few in very important ways. One such development which will be discussed in greater detail in another section of this paper will be the advancement of organ transplant techniques. Another, more directly technical advance is the development of the electronic pacemaker which, when implanted in the body, regulates heart activity. Another device can, by the flick of a switch, relieve or even prevent the pain ordinarily inflicted upon people suffering from angina pectoris, severe heart pain which causes the sufferer to give up virtually all physical activity.* Such a device can transform the life of the user.

There are also vast possibilities for using drugs and other stimulae to increase the ability of people to learn or remember. Such a capability could totally revolutionize our theories and means of education. Likewise, similar substances are likely to become available to cause people to forget, either totally or selectively, bodies of knowledge and experience.** Naturally, the opportunities for misuse of such a capability are manifold, either on an individual, organizational, or even national and international scale.

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*Washington Evening Star, December 31, 1967, p. B-6.

**These issues are discussed in detail by Lottie E. Mackay in "Drugs to Improve Memory and Learning," Part VII of this report.

5. Demographic Effects*

Many countries have already felt the impact of the cluster of developments that have produced a large decline in infant and other mortality. Because birth control methods have always existed, new techniques in contraception are not likely to have as rapid or striking effect on world demography as did the techniques for reducing mortality, unless it becomes technically possible to impose birth control by social decision. However, new inventions for low-cost, mass production of food calories and proteins are likely to become very important. Various developments and suggestions have already been made. For instance, it has been suggested that soda pop be fortified with nutrients and vitamins.** Experiments are under way with feeding rats an artificial diet composed of chemicals designed to replace the carbohydrates and fats of normal food. A protein substitute is also under development.*** And recent reports delineate a fish-based protein food additive which may already be marketable.****

In addition, there are relatively familiar techniques of improving agricultural yield through improved farming practices, and new seed strains (such as those for IR-8 and IR-5 rice and high-yielding wheat) which have been developed and applied in Southeast Asia and Mexico.

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*We use the word "demography" here in the relatively narrow sense of "basic characteristics of populations, such as size, birth and death rates, adequacy of food supply, etc."

**See The Wall Street Journal, February 9, 1968, p. 6, and the Washington Post, June 5, 1968, p. B-4. For other suggestions see The New York Times, January 19, 1968, p. 72 and April 7, 1968, p. 13.

***The New York Times, June 14, 1968, p. 53.

****The Washington Evening Star, May 11, 1968, p. 1.

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Not least are the infinite possibilities for reaping the food resources beneath the seas, possibilities which are daily advanced by new developments in oceanography.

6. Internal Political Effects

There is a growing awareness that new developments in technology and growing affluence may create very specific internal political and social issues. These issues, while different for countries in different stages or situations, may still be extremely important in each of them.

One of the more obvious issues is that of excessively degradable (or unreliably reassuring) centralized capabilities. For instance, we are all familiar with the blackout in the U.S. Northeast on November 9, 1965. A less familiar but potentially more important example of this problem is the fact that centralized "command and control" or other administrative systems tend to filter the information that goes to the top and thus give a very incomplete or dangerous picture of reality, and yet they may be used as substitutes--often poor and dangerous substitutes--for other modes of information. Modern management techniques, in government, industry, and the military, produce enormous advantages. Yet there may be serious losses in terms of seeing, feeling, hearing, and otherwise absorbing the full situation, of being "on the scene," or talking directly with the people involved, in not using sufficiently the more "normal" and traditional human organizational and information networks. Even if one does not actually degrade one's information by excessive reliance on the automated system, but retains the more direct techniques, the enormously detailed and orderly information that one gets from the new system may lead to unjustified confidence that one understands what is happening, possibly resulting in overcontrol or miscontrol. In any case, the more impressive and "scientific" system may out-compete the other source of information and thus result in as much misinformed control as if the other systems did not exist. Another problem with all such centralized facilities, whether of electrical or of political power, is that they may create real vulnerabilities which may be exploited by people who want to cause trouble. Furthermore, the overly centralized and automated information network creates great psychological distance between leaders and followers. This seems to be one of the sources of student rebellion at Berkeley, where students resented their feeling--whether justified or not--of being cards in an IBM machine as far as the administration was concerned. (They carried signs reading, "I am a human being, do not fold, spindle, or mutilate.") This kind of alienation could become widespread in a society dominated by impersonal, automated procedures.

Some of the new technologies and even the new affluence create obvious opportunities for agitation, propaganda, and disturbances generally. New affluence also raises expectations which, on meeting frustration, result in much more disruptive reactions than were produced by the much worse, earlier conditions.

Another issue which has been sharply raised by a number of observers* is that the world is becoming so complex and changing so rapidly and dangerously and the need for anticipating problems is so great, that we may be tempted to sacrifice (or can no longer afford) democratic political processes. It is important to recall that tyrants or Caesars have frequently come to power as a result of an overwhelming desire from the mass of people for firm leadership--leadership that cannot be supplied under existing democratic processes, or from an excess of problems and issues which create the need for such leadership.* Even if we don't get Caesarism, more and more decisions may be made by relatively narrow-minded technocrats, who, intelligent, responsible, and well-trained as they may be, still may have what Veblen called a "trained incapacity" to consider problems that are outside their special point of view or sphere of interest.

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*See, for example, Amaury de Riencourt, The Coming Caesars, Coward-McCann, New York, 1957.

The possibility of nuclear weapons' affecting internal politics** is less likely to be important to the developed nations, but we can note that at least one developed nation, France, almost ran into this problem,*** as did the Chinese in Sinkiang.****

7. International Effects

A critically important future development will be the capacity of world-wide communications to show underdeveloped populations what life is like in a modernized society. On the one hand, this will drive home the point that poverty and disease are not inevitable, and should stimulate the desire for modernization--a desire which, incidentally, can lead quickly to frustration and thence to political instability if progress is not made rapidly. On the other hand, the example of the hippies and dropouts, or a general relaxation of the Puritan ethic* in developed nations, may dim the allure for modernization in disadvantaged regions. The ambivalence may complicate the job of lifting those economies since what will be needed are responsible, intelligent local entrepreneurs and dedicated administrators.

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*See Eric Hoffer, The True Believer (New York: Harper & Row, 1951) for some perceptive comments on this phenomenon.

**A discussion of this range of issues, by Lewis Bohn, is included in Selected Papers from the Hudson Institute, Volume II-A of the Working Papers of the Commission on the Year 2000 of the American Academy of Arts and Sciences.

***See D.G. Brennan, "The Risks of Spreading Weapons: A Historical Case," to be published in the first issue of Arms Control and Disarmament Annual Review, jointly published by Hudson Institute and Pergamon Press.

****The New York Times, February 5, 1967, Sec. IV, p. E-8; Wall Street Journal, February 1, 1967, p. 1.

Prospects seem to be increasing that the traditional path to economic progress, the exploitation of cheap labor, may become much less usable, because modern technology will tend to make even the cheapest unskilled labor too expensive. Such difficulties will be exacerbated with the increasing availability of cheap and rapid transportation. The "brain drain"--the movement of more skilled and mobile persons to the developed nations--will be accelerated. With more leisure time as well as better transportation, these persons will not even have to contend with homesickness. They will be able to commute to their native lands for weekends.

Whether or not this occurs, there has been conjecture that the international trading system includes a tendency towards unfavorable terms of trade to underdeveloped nations. That is, according to this argument, the prices of the goods of the developed nations go up more rapidly than the prices of the goods of the undeveloped nations. This is a controversial issue which cannot be settled here. Whatever the facts of the overall terms of trade, there are many ways in which undeveloped nations may find the year 2000 more difficult than the present, because of an at least relatively decreased importance of both raw material and cheap labor. In fact, this could become a spectacular problem, if, for example, synthetics are produced which make obsolete important resources of undeveloped nations.

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*See The Year 2000, op. cit., Chapter IV.

Despite these difficulties there is likely to be an attempt to accelerate the rate of modernization. Such forced modernization may create various "culture shock" phenomena, or at least serious difficulties and frustrations which then give rise to other problems. It is possible that people of the developed nations will feel highly motivated to help those in the underdeveloped nations to overcome the problems of too-rapid modernization. But unfortunately, campaigns to foster such motivations most often appeal to feelings of guilt, shame, or fear rather than more positive attitudes; this in turn can create contraproductive attitudes in both the aid-giving and the recipient nations. The results of this syndrome may make it impossible for either the donor or the recipient state to follow firmly "paternalistic," economically stabilizing, or even efficient policies.

The development of synthetic foods (or other primary products) could have an upsetting effect in several ways. Removal of the danger of major famine may almost rule out serious birth control programs in some nations. At the same time, the problems of education and economic development may remain insoluble until population growth can be stabilized. Furthermore, a greatly increased supply of manpower could be politically, socially, and economically disastrous if there is no constructive way to use it. The same dilemma arises in slightly different form when education becomes cheap and an "over-educated" group develops (as in India today) that cannot be absorbed into the economy because there are not enough jobs requiring a high degree of education and skill. (This is a consequence of unrealistic expectations about what social status should go with educational attainments, and not necessarily of better education.)

One final example of the potential for upset of new technologies: it is increasingly likely that the oceans--possibly even the moon, planets, and outer space--may become areas of competing or even incompatible economic and military exploitation. They could then become the focus of new international tensions or crises.

8. Pervasive and Dynamic Effects

The impact of some inventions goes beyond the relatively specific or limited effects discussed above, to create new kinds of technology and new industries, or stimulate spectacular growth in older ones by causing a qualitative change in some capability, or radically reducing the cost of some basic commodity with a large price elasticity. The telephone is one of many dramatic historical examples. The transistor, without which modern high-speed computers would have been impossible, is another. The "light pipe" or very cheap thermonuclear fusion-power* might have similar leverage effects on the economy of the future (apart from other kinds of impacts).

Such "inventions" get so spread through the technology of a society that it is virtually impossible to trace out even a fraction of the significant interactions, although some particular--perhaps the primary--

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*Controlled fusion may be almost as significant for its reduction of the cost of neutrons as for its reduction of the cost of heat. Very cheap neutrons can certainly be of military-political significance and may also be important economically.

effects may be analyzable. Discussing the impact of such inventions begins to be like discussing the impact of technology as a whole.

Affluence, literacy, and education are obviously worth while. It is important, however, to notice some of the problems they bring. Affluence and economic growth, by decreasing the importance of work and economic rationality, may give rise to disturbances centering around problems of alienation, demoralization, and reactionary and/or utopian ideological attacks on dominant social values. Similarly, economic development has made possible (and to some extent, necessary) a great increase in general educational levels. The result has no doubt been an enormous increase in personal satisfactions, an appreciable improvement in economic productivity, and much smaller (and to many who had placed their hopes on public education, disappointing) improvements in political rationality and the quality of civilized life. Yet it must be remembered that an overemphasis on education can result in shallow intellectualism; mandarism (the intellectual as "father and mother of his country"); an overemphasis on "book learning" (conceptual world and documented information rather than existential world and perceived or orally transmitted information); an expansion and prolongation of the adolescent sub-culture; a meritocracy; excessive theorizing, intellectual and/or educated parochialism; alienation from one's own culture or sub-culture; and other estrangement from the practical world.

9. Personal Choices With Wide-Ranging Social Effects

Finally, we enter the realm of those technological advances which cause or affect individual and personal decisions--decisions which, once made, affect the lives not only of those making the choices, but others around them, possibly their progeny; and eventually, if such decisions are widespread enough, they have the potential to broadly affect society itself. Many of these issues seem far more bizarre to us today than do most of those we have discussed above.

Advances have already been made which make it easy to foresee the day when we will be able to choose the sex of our children. The implications of these advances could be drastic, if, say, 90% of the people were to choose sons over daughters, or vice versa. On the other hand, properly employed, such a capability could help to wipe out or at least seriously limit the occurrance of sex-linked diseases.*

Other advances in genetic engineering have already led to the isolation of DNA, one of the substances which actually store and pass on the model for hereditary features. And this substance has been created artificially.**

At North Carolina University experiments have been carried out to produce "multi-mice"--that is, mice which were created by more than two parents. In these experiments two pairs of mice were mated separately. Two days later the embryos were removed from the mothers and the membrane surrounding each embryo was dissolved. The two cell combinations were then placed in a laboratory dish in an incubator for several days and after they had joined into a single cell cluster were implanted in the womb of a third female. At the end of the prenatal term a mouse was born which shared the characteristics of both sets of parents.***

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*Robert Edwards and Richard Gardner, "Choosing Sex Before Birth," New Scientist, Vol. 38, No. 595, 2 May 1968, p. 218.

**The New York Times, December 15, 1967, p. 1.

***The New York Times, May 30, 1968, p. 12.

The implications of such experiments in genetic engineering are far-reaching. It makes it possible to envision some future society breeding a generation of Hollywood-style "beauties"--or breeding in far less desirable characteristics. Perhaps some nation could breed a super-generation. Selective breeding in any case could lead to a drastically unbalanced society. Imagine a nation of geniuses, when today a country like India cannot properly utilize even that small number who are merely "educated."*

People may be able to affect their physical features more than they can today, and may even be able to change their physique. This could lead--particularly if there is excessive and faddist or fashionable use--to the loss of identity, to depersonalization of the individual, to a sense of impermanence in even the closest human relations, and so on.

The issue of lengthy hibernation or even the preservation of corpses for possible revival later may also come up before the year 2000. At the simplest level one can imagine very sick individuals being put into some state in which their body processes can be slowed down--perhaps stopped--in the hope of giving doctors time to carry out extensive operations at some later date. If the technique improves there may be a hope that medical science will eventually develop to a point at which these currently incurable individuals can be cured. On the other side, however, questions of the care and the preservation of the individual and the management of his personal property raise varied and difficult issues. Even more difficult to deal with, from the viewpoint of social policy, would be the voluntary choice of a healthy individual to hibernate for personal reasons--perhaps because he simply wants to see the future, or to outlive his spouse, or to invest money and collect on his investment at a much later date.

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*See The Year 2000, op. cit., Ch. II, Section H, for further discussion of the issues involved in choosing the sex of children and other aspects of genetic engineering.

There has been much discussion recently of the possibility of preserving one's body after death for possible resurrection in the future. One such experiment has already been undertaken by the Cryonics Society of California. The Society "froze" Dr. James H. Bedford immediately upon his death and intends to preserve him as long as necessary, that is, until the medical skills for restoring him to life and health become available. The "freezing process" is still in the experimental stage; in fact it is not yet known to what extent the human body may be damaged by freezing or how completely any such damage could be repaired.

Proponents expect that the appeal of their idea will spread rapidly.

> The Cryonics Society of New York City has a capsule waiting. The local organization, says Dr. Dante Brunol, science adviser to the California group, has promised to fly East when notified that a member faces clinical death. Legal forms have been prepared.
>
> The candidate for freezing must set aside $10,000 for dry ice, capsule, liquid nitrogen, perpetual care and, hopefully, restoration. Close relatives must sign an affidavit pledging non-interference.

The group is even

> ...discussing possible mass production of "cryogenic preservation units"--each holding 16 bodies--with John G. Flynn, president of Bio-Preservation, Inc.

Yet there are problems attendant to the possible widespread application of cryonics.

> Some clergymen feared over-population. Others worried about the problem of adjustment for the thawed people....
>
> Cryonics leaders in New York conceded that mass freezing would pose immense legal headaches. Would marriages survive freezing? And what about estates? Many patients would want to take it with them.*

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*The New York Times, January 29, 1967, p. 58; Robert C. Ettinger, The Prospect of Immortality, Macfadden-Bartell, New York, 1966. Related issues, such as organ transplants, also should be noted. See, e.g., F.E. Camps, "Defining Death," Science Journal, June, 1967.

In the more immediate future, there is ample reason to be concerned about the rapidly increasing use of the so-called mind-expanding drugs--now being hailed by some as examples of "better living through chemistry." Even if it could be proved that these drugs have no adverse physiological effects (many experts claim that marijuana does less physical damage than either alcohol or tobacco), the short-range gratifications such drugs offer may tend to decrease the user's motivation to perform tasks that are difficult but individually or socially beneficial.* Affluence brings with it a more permissive society, but someone will still have to maintain that society.

The "mind-expanding" drugs, such as LSD, are only the most dramatic manifestation of the over-all drug problem, evident in the increasing use of caffeine, nicotine, aspirin, tranquilizers, sedatives, stimulants, anti-depressants, and other mood-changers. As psycho-pharmacology progresses, it may become possible to alleviate not only incapacitating mental illness, but also such states as everyday anxiety or guilt, which often serve indispensable psychological or social purposes, though they may feel unpleasant at the time. The mass of men may no longer have to lead what Thoreau called "lives of quiet desperation," but their liberation may be quite different than his hopes.

On the other hand, use of such drugs, whether for medicinal or for pleasure-producing purposes, in excess or before they have been thoroughly tested, can have drastic consequences. For instance, recall the rash of "thalidomide babies" born several years ago because expectant mothers had taken the tranquilizing drug. And speculation increases as to whether LSD may have effects that can be passed on to an unborn child. Currently study is under way to determine if other substances, as common to our daily lives as "various drugs, X-rays, insecticides, and excessive amounts of vitamins," have been agents of birth defects.*

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*There are also physiological dangers, of course: See, e.g., Walter Modell, "Mass Drug Catastrophes and the Roles of Science and Technology," Science, April 21, 1967, p. 346.

Aldous Huxley described the possibilities in introducing the "soma" pill in his Brave New World. When troubles pressed down on anyone, he had only to take a "soma" to produce a feeling that everything was all right, whether it was or not. The drug did away with any sense of dissatisfaction or desire to protest (or, for that matter, to progress).

Today, we are already close to such a pill, with all its potential for producing passivity--political, social, and psychological. The opiate of the people may again be an opiate, though in new and improved form.

It is not at all clear whether we can develop institutions or even theories for dealing with this kind of development effectively. The controversy over legalizing marijuana is a case in point. On the one hand, it is said that prohibition did not prevent the use of alcohol; if anything, it encouraged such use, and led to a growth not only of individual crimes and general disrespect for law but also of a new criminal industry. Analogously, keeping the trade in marijuana illegal may have worse consequences than legalization, assuming that marijuana is no worse than alcohol in inflicting physical or mental harm on the user, or in precipitating irresponsible behavior. On the other hand, this argument becomes valid only after use of marijuana becomes widespread. Until then, it is not enough to argue that marijuana is no worse than alcohol. Why add its potential evils to those of alcohol? Surely, there is something wrong when we have no way of dealing with this problem until widespread usage has become a social norm; our ability to deal better with the marijuana issue than we did with that of alcohol (consider Prohibition, alcoholism, drunken driving) is especially important since we are likely to be faced with a series of increasingly difficult issues arising from new developments in psycho-pharmacology.

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*The New York Times, December 18, 1967, p. 39.

Finally, it is possible that many more people may become subject to excessive narcissism. Particularly, those people in the post-industrial societies, brought up under conditions of extreme affluence and permissiveness, may come to regard themselves as extraordinarily expensive, valuable, fragile objects deserving especially good care. There may be an attitude of almost complete unwillingness to risk (or even inconvenience) this valuable and fragile object in any way, perhaps coupled with a sense of superiority over lesser breeds which do not have this "special" character. There would be a particular unwillingness to risk these expensive and complex citizens on any kind of "equal terms" in international conflicts--especially if they are thrown into the world on a man-to-man basis with "savage hordes"--and it might be difficult for a post-industrial society to defend itself when its technology could not be put to decisive use. Almost any activity requiring sacrifice or hardship on behalf of the community might find few recruits.

C. THE SPECIAL IMPACT OF MILITARY TECHNOLOGY

There are at least three classes of impact of military technology. The first is what might be called the purely internal military impact. For example, the development of high-quality surface-to-air missiles made it necessary to have bombers that were able to attack at very low levels. Thus it brought changes both in aircraft technology and bombing tactics, but without significantly altering the basic military equation.

A second class of impact, far more rare, is one in which an invention changes basic military relationships. For example, the development of nuclear weapons led to the predominance of deterrence over defense. Similarly, cheap nuclear weapons may in the future have the "equalizing" effect of reducing the military advantage which has hitherto been derived from industrial strength.

Thirdly, and in a quite different direction, military developments may have an impact on civilian technology. Looked at broadly, the nuclear weapon speeded the introduction of nuclear energy into civilian technology. On a more mundane level, there have been (and probably will continue to be) a series of aircraft developments that originated in the military field and were then passed along to the civilian.

In assessing the impact of an invention for civilian use, one is _sometimes_ faced with a two-sided problem: for example, the importance of nuclear power depended to an important extent upon cost trends in coal power production. On the other hand, many other civilian inventions, such as the television set, are not really two-sided problems in the same sense. However, in dealing with military impact of inventions, one is confronted with a problem that is _always_ and fundamentally two-sided, or many-sided.

Furthermore, military technology is more rapidly changing as well as more strongly interacting than civilian technology.

It is clear that the middle of the 20th Century marked the beginning of a new era, in which mass destruction on an unprecedented scale became possible. It was common in the mid- and late 1950's to talk glibly of "overkill" and of total world destruction, though in fact no one had made calculations demonstrating the likelihood of such an event with the weapons system then available. But weapons technology continues to "progress," and it is possible that the "ultimate" in weaponry, the so-called Doomsday Machine* that can destroy all human life, will become not only technologically feasible but inexpensive.

One of the most important U.S. nuclear programs, Atoms for Peace, makes cheap power widely available. But it also makes fissile materials available to many nations that could learn to produce nuclear weapons with them rather easily.** Other peaceful technologies could also bestow on their possessors the capability for making nuclear weapons, or chemical or biological agents of mass destruction. Today, much civilian technology can be adapted rapidly for military use, even if it must be done in improvised fashion.

The biological and chemical sciences are progressing swiftly. One result is that new weapons are invented even when they are not the objects of research. As with nuclear weapons, there is much apocalyptic and exaggerated language about biological and chemical weapons. Even though they have been "improved" ten-fold since World War I, when they were last used on a large scale, their capabilities are often overestimated, at least so far as normal military objectives are concerned. It is often said that biological and chemical technology is most likely to be suitable for small or less advanced countries, and the largest countries do not have biological and chemical weapons that can match the "straightforward" destruction of nuclear weapons. This situation could change in the event a treaty is put into effect that actually succeeded in retarding the spread of nuclear weapons.

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*Suggested originally as a reductio ad absurdum of certain ideas of instant, massive, and automatic retaliation as a deterrent. See H. Kahn, On Thermonuclear War (Princeton, N.J.: Princeton University Press, 1960), esp. pp. 145-151.

**See The Year 2000, op. cit., pp. 70-74; see also Science News, 20 May 1967, p. 470.

Though the issues involved are quite different from those raised by mass-destruction weapons, research in molecular biology and genetics could produce a technology that would be very dangerous in the hands of an unrestrained government. If it becomes possible to alter the genetic inheritance of human beings, some governments might attempt to reshape part or most of their populations in ways considered undesirable by the rest of mankind. For example, they might carry out another element of Huxley's fantasy and breed legions of slaves--or soldiers--who have abnormal physical prowess and docile, unquestioning minds.

There are many possible new techniques for insurgency, crime, or ordinary violence. Some extraordinarily destructive weapons might get into the hands of relatively small groups and be used for insurgent or criminal operations or even for "pointless" destruction. We may also expect new techniques for counter-insurgency and "counter-criminality," and these in turn could cause serious problems of excessive or unjustly imposed order. Thus, new technology may shift the balance between "order" and "disorder" either way, or in both ways simultaneously. Since undemocratic, illegitimate, or unpopular regimes may have the greatest difficulties with sedition or insurgency, new technology that further strengthens the hand of those in power may be, on the whole, undesirable.

Finally, and perhaps most important, there will be unexpected synergisms and serendipities which--in this area at least--seem as likely to cause trouble as not. While in a longer discussion we might conjecture more or less systematically about these potentialities, it is clear that some will occur that will not be anticipated. Here we will simply note this as a category of very wide implications.

D. CONCLUSION

Many of the technological changes discussed in earlier sections of this paper have brought into effect unforeseen, unwanted consequences. Most obviously we have the fouling of the nest: the ecological damage that industrial society has done by the accumulation of its waste products--oxides, isotopes, dirt, junk accumulating at a tremendous rate. But this must be seen as part of the price the society will pay for economic progress.

In the 19th century, when a man wanted to build a sawmill by the side of a stream, had the community told him, "You cannot dump the waste into this stream," it would have been prohibitive to build the sawmill. He would have had to cart the waste away in a horse and buggy and bury it somewhere. The country would not have developed if people had been unwilling to begin the process of pollution. Then there were many streams; there were ample resources for carrying away wastes; and the economic values and the importance of efficiency were all much greater than they are today. It was necessary to begin the development.

Now, however, we are much more affluent and we are in a position to begin to care about the damage that has been done by ecological contamination. The contamination has grown far more serious and now it is clear that we have probably postponed by several decades too long the job of cleaning up.

Ways are being developed to prolong human lives by means of artificial organs. We are familiar with the controversial matter of the transplants: when is a donor legitimately available as a donor for a spare heart; would it not be a good idea, for example, to keep some human beings alive during a longer period of time during which the hearts could be removed and implanted in new recipients? From a certain point of view this would make sense; yet, it horrifies us. But a heart transplant itself would have horrified many people in earlier generations. We have a way of getting used to these things.

There is a possibility that people may be dehumanized and the lines between human and non-human entities, between the self and the non-self may be lowered as substitution of mechanical parts and parts from other people becomes more and more routine. This is not a process that will stop with heart or kidney transplants.

Should nuclear weapons become more widely available, and they begin, as they already have, to affect the domestic politics of some countries like France and China, as they become available to criminal groups, as they become available for coups, people will want a rather omniscient police force that is very careful to observe anyone who might have access to some kind of weapon of mass destruction. And these may be, as "progress" continues, chemical or biological as well as nuclear. Possibilities for radical technological or technologically caused developments have by no means been exhausted. There has been considerable speculation that governments, unable to cope with rapid change, will find it necessary to limit innovation, even at the risk of becoming despotic, either internally or externally. For example, the world may not tolerate unchecked population growth in less developed areas that depend on international aid for support. Other "justifications" may be found for interference in the internal affairs of nations--by other nations or by an international system. For example, if a nation started to build a "Doomsday Machine," there would surely be interference from outside.

Privacy itself may not be possible in this kind of society. (Privacy could here mean that of the individual, the community, or even the nation.) One can imagine the situation becoming so extreme that some societies would consider it a question of life and death.

World-wide changes in environment, caused by man's activities, are already under way. It is impossible to say whether or not we are on the way to disaster, or at what rate. There has already been a significant accumulation of carbon dioxide in the atmosphere, primarily as a result of the burning of fossil fuels. This, together with the production of smog, and similar processes, should already be causing a "greenhouse effect," raising the temperature throughout the world. This should result in melting of the polar icecaps, bringing about flooding of coastal areas and port cities, and the eventual closing of vast agricultural areas to further farming. Yet the system that maintains the earth's temperature is so little understood that no satisfactory explanation can be given for the fact that these effects do not yet seem to have started. But the possibility is with us increasingly, as the effects of man's activities become larger and larger, that at any time we could poison or otherwise alter the earth to the point where it could no longer support life as we know it. It is hoped that such potential disaster would be discernible in time to effect change.

Interplanetary contamination is one hazard of the current space programs that seems, at least at this early stage, to have received appropriate recognition. (Indeed, concern for the hygiene of other planets seems far more tender than for the inhabitants of this planet; the assumption sometimes seems to be that for this planet, it is already too late.) As the space programs continue, the pressures to reduce precautions with respect to human impingement on the extra-terrestrial environments will increase enormously. To resist pressures will probably be a difficult and commendable achievement.

As examples in this paper illustrate, there are many ways in which new technology is creating new problems. On the whole these are not problems that are so serious that it would be better not to get into them at all, but problems that could be disastrous even in a rather final way if we do not take sufficient account of them as we go along.

The legend of Faust provides an interesting insight into ways people have felt about such issues. During the medieval period, the notion was that Faust had made a bargain with the devil by which he had obtained knowledge, power, youth, mastery of women and so forth. As a result of having more of such prowess than a man was ordinarily entitled to, he paid by having his soul go to the devil.

The medieval mind was quite clear: mortal man gained extraordinary powers only at the price of his final destruction.

But during the period of romanticism and enlightenment, Goethe rewrote the Faust legend. His Faust made quite a different bargain. He bargained specifically for the kinds of power which would never satisfy him. For example, he asked if the devil could supply him with the kind of girl who, while her head was on his shoulder, would already be ogling his neighbor, and he explained that this would keep him from being complacent.

And the devil agreed to grant him such powers, and to supply him with such transient pleasures. Faust bargained with the devil that if he were ever to become satiated, then the devil could claim his soul, and his striving, his prowess, would come to an end.

And so he pursued, in effect, an exemplary modern, Western life, characterized by an extraordinary development of manipulative rationality and of heroic striving for knowledge and power. He carried out many sensate, bourgeois projects, such as one in economic development, in which he cleared land from the sea and built dikes. He specified that the dikes ought to be slightly unsafe, since he thought that it would not be good for people living on the cleared land to become too inactive.

Finally, feeling himself contented, Faust said to the moment: "Abide with me, thou art so fair!" and at this point the devil claimed his soul. But angels intervened in Goethe's play, saying, in effect, "this man has been so good at it, he's been so heroic, he's done so well with his striving, prowess, and knowledge, it wouldn't be right to let his soul go to the devil." And so they saved him.

Our own situation presumably is not one in which by applying our economic and technological powers we inevitably will be doomed, nor is it one in which we can count on divine intervention to save us. Whether we steer a safe course among the hazards will depend on luck, and in large part, on our skill. If technical rationality seems about to lead us into dangers, it may also be able to help somewhat to lead us through them.

It is clear that Western man now has Faustian powers, which are impossible to renounce. Realistically, the possibility must be faced that man's unremitting Faustian striving may ultimately remake both his inner and outer environment, to the point where he will be de-humanized or where his life on earth will be altered in some disastrous and irrevocable way.

Already, awesome choices are before him. For example, we already have some power to alter the weather. Suppose that in the future we can divert a hurricane. With this ability will come the responsibility of deciding where to send it. The choice will have to be made, for we will have foreclosed the option of leaving the decision to nature. In this area, as in many others, whose property will be destroyed, whose lives will be jeopardized or lost, will become matters for administrative decision. On what bases should the choices be made, and by whom?

There is a widespread, Luddite response to such problems in which the artifacts of technology themselves become the targets of hostility. Also prevalent is the simplistic view that technology now presents man with an either/or choice between immolation and utopia. But evils may not be stark and obvious; they may be subtle, slow-acting, uncertain--and well distributed among all the available options. A series of decisions can be taken separately, for good reasons, and yet produce an ultimate condition that, had it been foreseen, no one would have wanted. Practically all the major changes since the beginning of industrialization have brought unexpected and unwanted consequences. Research that began as an expression of the value of the individual human life could easily become a step toward the treatment of men as disposable objects.

One of the great tasks faced by society is to facilitate intellectual preparation for the kinds of social decisions that will be required in the affluent, technologically accelerating, rapidly changing society of the future. Clearly, we must attain a better understanding of the kinds of Faustian power over nature (including human nature) that may come into human possession, and a better public understanding of the issues involved in deciding what should be done with such capabilities.

What we need to do is to have a better grasp of how social action may lead to these unanticipated or unwanted results. We need to have a better understanding of the effects of social policies. If we cannot learn not only to take full advantage of our increasing technological success, but also to cope with its dangerous responsibilities, we may only have thrown off one set of chains--nature-imposed--for another, in one sense man-made, but in a perhaps deeper sense, as Faust learned, also imposed by nature.

If there is any single lesson that emerges from the above, it seems to be this: while it would certainly be desirable and might even be helpful to have a better grasp of how social action may lead to unanticipated or unwanted results, it is not likely to be sufficient. We need to develop the capacity to make judgments and a public capacity to evaluate judgments made by experts on matters such as the evaluation and comparison of costs and benefits of alternative policies. We need institutional arrangements for the protection of apparently conflicting interests. We need to have a willingness to exploit new technological opportunities, but at the same time we may need to make social decisions to refrain from exercising dangerous options.

We need to regulate centrally certain choices--and this will be a new thing for us. But we need to preserve, at the same time, some freedom for individual choice. We need to deal publicly and explicitly with many issues that up to now have been left to the discretion of individuals or private groups.

Put more schematically, we must develop a capacity to make judgments, or to appreciate judgments that have been made by "experts" on problems of various institutional arrangements for protecting interests such as those that comprise the following three pairs of related dilemmas:

1. a) preserving a willingness and capability for efficiently exploiting new technological opportunities,

   b) yet, at the same time, making social decisions to refrain from exercising dangerous options;

2. a) regulating centrally such choices as may be, in the aggregate, socially dangerous,

   b) yet, at the same time, preserving freedom of individual choice;

3. a) dealing publicly and explicitly with certain issues (e.g., triage) that have been heretofore left to the discretion of individuals or private groups (e.g., of physicians),

   b) yet, at the same time, preserving, in selected cases, the advantages of deferring or delegating explicit decisions.

For example, there are a great many decisions that are made by physicians, that are matters of life and death, and that have increasing importance in our society. Up to now their discretion as to these decisions has not been informed by any kind of public discussion. Who is qualified to receive treatment at a kidney machine? Six thousand people a year are turned away, in effect sentenced to death, because they cannot afford (or the society has not invested in) renal treatment which they need. How are they chosen? How should they be chosen?

Who is qualified to be the recipient of a heart? Who is qualified to determine when a patient whose heart has stopped ought not to be resuscitated? On what basis should such a decision be made?

In many cases we need to delegate or defer these decisions even where they are of great importance. It would be hazardous to make these things explicit too soon.

What we need finally is a greater respect than we have had, up to now, for the world as we find it, in spite of the mounting impressiveness of the technical rational structure that the manipulative society is building. We need to rediscover the values of restraining our well-rationalized, Faustian impulses to overpower the environment. We must develop a greater concern than we have had up to now for perpetuating institutions that protect freedom of human choice, not only for today's individuals, and the various social groups that would want their views represented, but also for those who will follow us, those who, in the future, may experience their problems differently, and would not want to find that we have already foreclosed their choices and altered their natural, social and biological world irretrievably.

But after all this is said, we must be aware that, in the final analysis, these efforts can never be entirely successful. Almost the only safeguard that then remains is to try to exercise judiciously and selectively our Faustian impulses to overpower the environment. This means we must learn to guide our uses of our accumulating power, and to increase our respect for its disastrous potential.

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PART NINE

WORLD-WIDE ASPECTS OF THE STUDENT MOVEMENT

A Preliminary Report on a Continuing
Study of Student Movements

By

Andrew G. Caranfil

WORLD-WIDE ASPECTS OF THE STUDENT MOVEMENT

A Preliminary Report on a Continuing Study of Student Movements

Until the middle 1960's relatively little attention was paid to the impact of students on reform and radical movements, in part because student movements are more transitory and leave fewer records than adult organizations. But the range of student protest and reform movements in the past few years has been striking.

Today's students have been described as the first "post-modern" generation.* A new style of dissent and unrest is emerging, not only in America, but in other industrialized countries as well--a youthful style that is a reflection of the reaction to the history of the past two decades. The situation of the student has been profoundly affected by certain general tendencies in modern social structures. Sociologists have noted that social mobility is consistently high in all advanced industrial societies, and also that when other means decline in importance, education becomes the key to upward social mobility. As overall security and affluence diminish status anxiety, commitments and envies among the young begin to take new forms. Students in our times are free from the anxiety of learning and conforming to past traditions. And in this technological age, university training is more and more a right rather than a privilege. Their freedom of choice is great, and it is not surprising that some of the bases of order are destroyed as a result, or that the anarchic tendencies of militant youths are strengthened.

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*K. Keniston, "Youth, Change and Violence," The American Scholar, Spring 1968, p. 228.

In the past, however rebellious he felt, the student faced a future in the "real" world contingent on a double conformity, to his elders and his society's mores. Today's student is much less tightly bound by these constraints. Secure in the knowledge that technological society will provide a livelihood if he is willing to conform to its patterns, the student can enjoy his non-productive status. He is very unlikely to be in a hurry to abandon his role. He will toy with new and old ideas, adopt ideologies and attitudes opposed to a society he generally dislikes and fears, before resigning himself to join it.

Among the major factors which have had a determining impact on the "post-modern" generation are:

1. A historically unpredictable future and apprehension of an essentially explosive world.
2. The revaluation of traditional culture and knowledge.
3. The changed values and role of class in industrialized societies.
4. New energies released by diminished burden of love and sex.

When the future appears uncertainly continuous, politics and order are invariably devalued by the young. Attitudes toward political action becomes more permissive and less serious. Movements such as the New Left and the hippies are non-dogmatic and to a large extent hostile to doctrine and formula.

A decade ago, there was considerable speculation on the apparent apathy of students. Dubbed the "silent generation," students of the middle 1950's were characterized as ideologically complacent, highly rational and ambitious to achieve a place in the rapidly expanding affluent society. But rapid social change and new values led to an increasing credibility gap between the generations. The educated young could not fail to sense a discrepancy between their parents' avowed and consciously held high ideals and goals and their actual performance in life.

The young have always confronted their elders and the established institutions, which generally appear too binding to them. The so-called "generation gap" has often been a topic of discussion in the past. What is significant today is the coherence and determination which the young are demonstrating. Post-modern youth have grave reservations about the society they will have to live in; they generally deplore the depersonalization of life in corporate structures or state organizations, the bureaucratization, careerism and commercialism, and seek to create new forces of association and action to oppose the technologism of our times. They feel that bigness, impersonality and hierarchy should be counteracted by simplicity, naturalness and a sense of personal fulfillment. This concern with "real" personal values is expressed in the founding Port Huron Charter (1962) of the Students for a Democratic Society (SDS):

> Our own social values involve conceptions of human beings, human relationships and social systems....We oppose the depersonalization that reduces human beings to the status of things. If anything, the brutalities of the 20th century teach that means and ends are intimately related, that vague appeals to 'posterity' cannot justify the mutilations of the present...

Michael Harrington, opening his latest book with the statement, "The American system doesn't seem to work any more,"* expresses an opinion held by a substantial portion of the student population. Harrington insists that all the unfulfilled promises of recent Administrations cannot be dismissed as mere political expediency. Our failure to implement needed reforms cannot be blamed on particular Presidents or laggard

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*Michael Harrington, Toward A Democratic Left (New York: Macmillan Co.), 1968, p. 3.

Administrations; it is a "coherent, consistent feature of our social structure."* This structure is now challenged by the students, whose ranks are rapidly growing, due to the student explosion coupled with longer study periods and greater financial accessibility. As many more thousands meet on overcrowded campuses, they become conscious of and discuss the inadequacies of the kind of education they are getting and the society they live in. This discussion and interaction create an active force which may range in form from a somewhat naive nineteenth century communal approach to a radicalization of the university for education more pertinent to the problems of our times. American colleges are traditionally oriented toward economic and status benefits. Self-extolled as liberal-humanist, they have tended to look on the world preponderantly in terms of economic opportunity. Few, if any, have taken steps to channel and inspire the emerging student force for change and progress.**

A generation is largely molded by its higher education, from which it derives attitudes that it will carry, however modified, into the future. Other sectors of society will look for leadership and ideas to the group which completes higher education. Given the hostile attitudes of a large portion of the young toward what Paul Goodman calls the "organized system," it is imperative that alternatives be conceptualized and offered in the universities to the "post-modern" generation.

This generation, seeking a more comprehensible and stimulating world, has adopted a characteristically all-inclusive pattern. This means a personal capacity for involvement with all that is superficially alien. Such inclusiveness leads to intense internationalism and inter-racialism. Thus, increasingly the reference group is the world--and the student movement is genuinely international. It may have succeeded where twentieth century working-class parties failed, namely in creating a mood where frontiers are no more than administrative inconveniences.

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*Ibid., p. 6.

**Fortunately, an improved system for higher education is envisaged for the creation of a humane intelligentsia. See Richard Brown, "A Role for Higher Education in Post-Industrial Society," Part VI of this report.

The upheavals at Berkeley, Columbia, the University of Wisconsin, to cite only the better-known examples, should lead to a reappraisal of the direction and programs of American universities. The activities of the New Left, as represented on campuses by the SDS, cannot be understood in a national context alone. The small group of social activists on the campus has become a permanent force in the political culture of the university of the 1960's. This is true of American as well as several large European universities (Paris, Berlin, Rome, Turin, London School of Economics). Considerable cross-fertilization of ideas and action has taken place and lessons can be drawn from both similarities and differences between U.S. and European universities.

University rebellion is as old as the Middle Ages. It has consistently presented a pattern of temporary bohemianism and a legitimated license of behavior. Since 1789, it has also involved experiment with radical politics--left and right, nationalist and internationalist. The majority of the young were never directly involved, but they found reference groups in extremist minorities, around whom serious student movements could be found at times of crisis or dissolution.

Fascism and Stalinism imposed a shape on these movements for over two decades. The end of polarization around a communist orthodoxy has led the student left to swing widely. All has become amorphous. Generous or dangerous impulses can discharge themselves in almost any direction and assume briefly almost any form. The results surprise both agents and spectators. In our age it is possible to buy revolt at a cheaper practical and psychological price than ever before. This may be fortunate; the erosion of a totalitarian ideology signals the beginning of hopeful change, though is accompanied by perplexities about student action. The greater willingness to recognize the political role of students stems in part from an awareness by many that other traditional social forces on the left are no longer available to support reformist actions. Organized labor in both America and Western Europe has become a basically conservative force. Marcuse has shown how, as part of the Old Left, the unions tend to oppose the efforts of rebellious students and intellectuals. As for the orthodox communist parties in Western Europe, they have become part of the regular system of representation and no longer advocate the use of extraparliamentary tactics. The ideological points invoked by the young often have no great depth or consistency, and student radicals discuss old materials as if they had just discovered well-established truths. But the willingness to do something about them in terms of political action is new.

For a thoughtful student is inclined to contest the world around him. Closer to ideas than to facts, he will tend to theorize, that is to simplify. Wishing to rationalize his universe, the student is often astonished to find it irrational and tends to overestimate--like so many others--his ability to find a better substitute. Students almost by definition are in the most disinterested period of their lives, for they do not give priority to material gains, but rather to intellectual views and ambitions. Among these is likely to be the view that man's inhumanity to and exploitation of man is due to the capitalist system and that by suppressing it, one liberates man.

The student movement would have little impact if there were not a crisis of values in the industrialized countries of the world. Sociologists have discerned that in some of these countries the era of industrial society has come to an end, superseded by a purely technological society. (Brzezinski calls it the "technetronic society.") This new society brings with it social changes which inevitably raise questions about established values. When the actions and aims of the authorities are questioned, and they themselves are no longer secure in their values, they become unable to react in a decisive manner. This opens the door to revolutionary situations, especially if concessionism becomes the prevailing pattern of behavior of the established order. Increasingly self-assertive revolutionary forces formulate issues to radicalize and mobilize masses against the status quo. The limited claims of reformers are turned into the more fundamental claims of revolutionaries. As adults appear in effect to surrender their responsibility of making morally demanding decisions, ideas become the property of the young.

The student minority which rebels is generally led by dedicated, bright young people. who are acutely aware of the contrast between myth and reality in their society and criticize their liberal parents for failing to practice the beliefs they hold. Many have a middle or upper middle class background--and have been raised in the expectation of having their demands acted upon without delay. They are, as Riesman pointed out, part of the generation raised according to Dr. Spock's preference for picking up babies when they express the need for something.

Student rebels more often than not are majority in sociology, psychology and the liberal arts, fields which train critics and reformers and which offer uncertain job prospects in the technological society. They may desire to remain outside this society and channel their ambitions into university reforms, civil rights and similar causes.

They view society as organized for efficiency and consumption of material goods at the expense of freedom of expression. Consequently, they may favor "participatory democracy"--the creation of self-governing local councils, a concept not too different from Petrograd Soviets of 1917. These councils would protect the human being from the "inhuman pressures" of the technological society. Student militants applaud the Marcusian view of a classless society without "war, horror, oppression, stupidity, ugliness." To understand the problems of the current world, "critical" (or "counter" or "free") universities may have to be set up, to teach topical issues to the young and to recreate the old ideal of the university as a small community of teachers and scholars pursuing inquiry together.

A major characteristic of the student movement, besides its universality, is the speed with which it has spread. The first signs appeared in the early 1960's, and the Berkeley Movement of 1964 is a landmark. Students increasingly observed the contradiction in a society which claims to uphold humanitarian and democratic values and yet promotes internally and externally a policy of intervention and suppression. The American movement grew as a result of the civil rights struggle and the escalation in Vietnam. Opposition to the draft, closely linked to the Vietnam problem, has been peculiar to the American students. In Europe, the movement did not have this specific impetus. In Germany, for example, the postwar leadership led the country from chaos to economic plenty in a democratic system. But the students find little to look forward to but the role of consumers in an inert society. The Grand Coalition has robbed the democratic system of a legitimate opposition, and a general malaise set in with the recent recession, the breakdown of NATO unity and disillusionment about reunification. Students are increasingly alienated from their parents (and also seek relief from the burden of past guilt in which they are uninvolved). In France, too, there is a gulf between the adults satisfied with the status quo and Gaullist paternalism, and discontented youth seeking change and renovation. French universities are not geared to prepare students for careers outside the academic and administrative structures. In Italy, for the first time the younger generation is demanding power to control the processes that form their culture. There as elsewhere, the university system is built to prepare students for the establishment.

It is rather extraordinary that in the spring of 1968 students challenged the establishment in countries as diverse as Gaullist France, Franco's Spain, Nasser's Egypt, Tito's Yugoslavia, Germany, Poland and Czechoslovakia, Italy, Turkey, Belgium, Sweden and the United States. They appear to challenge less the nature of the particular regime than the nature of its relation to them, its domination and constraints on their education. With peace, detente and material progress, regimes become routinized and lose sight of the ideals that brought them to power. The much-celebrated postwar stability has led to a certain ossification, which discourages ambition and imagination.

The workers' reasons for disenchantment with current regimes are of a different magnitude. They are threatened by technological unemployment and inflation and are kept from participating in productive decision-making. But youth is less prone to accept the nature of things and less likely to think about the paycheck at the end of the month. Ebullient students dream of higher goals than those offered them (if they are good and conscientious pupils) by a consumer society.

It is not by chance that the students' questioning of the whole premise of contemporary society finds an immediate response among all young people. There is no other cause to absorb their ardor. There are no faraway wars to attract the adventurous--Vietnam has become one of the least popular wars ever. Space exploration has a lesser appeal in Europe, since it appears reserved to the richest nations, the United States and the U.S.S.R., and because it is viewed as a manifestation of the technocratic society whose very premises are questioned by the young. Competitive sports, encouraged by all regimes, are not sufficient to burn up all the energies seeking ways of expression.

In many parts of the world, even the students willing to integrate themselves in a consumer society are held back by ever-slower promotion along the steps to the top. Decision-making remains in the hands of those who worked very hard to achieve their position and do not see why they should step aside for the benefit of younger aspirants. They fail to see that these younger aspirants may not be able to reap the benefit of a consumer society and thus consider themselves victims of injustice.

Economic growth brings ever-rising numbers of students whose talents are available. In Europe and elsewhere, they find it outrageous that the diplomas they worked so hard to get open only--in the best of cases--a place at the bottom of the stairs. Patience is not a virtue with the young, just as generosity is not with the elders. Student discontentment then seeks expression in "student power" to oppose the establishment, and if need be, displace it altogether.

The student movement may take one of two patsh. The first is easiest--the path of destruction. The destruction of universities as symbols of a hated society may be the most exalting solution, since it involves no compromises.

Since Rousseau, a number of revolutionaries have sought the chimera of an egalitarian society, without God or master, where man will at last be truly free. Perhaps the greatest illusion of young revolutionaries is that they can do without leaders or an elite; sooner or later, even in the most radical of environments, what Djilas has termed a "new class" takes over. And tradition is so strong a force, and the desire for revenge so great among the exploited, that the new leaders often end up copying the traits of the class they replaced.

The second path open to the students is more difficult. The young can work to impose and protect the continuous renewal, if not of the leading class, then of those leaders and decision-makers who are periodically elected to represent their ideals and wills. This may not be easy, but there must be other forms of dialogue than violence between youth and established power. Any establishment would do well to encourage younger elements eventually to share in the responsibilities of leadership and to promote a frank dialogue between the generations. New blood, bold ideas and constructive criticism can only help strengthen a regime, no matter what its nature. If the leadership does not heed the pressure from the younger generation it risks violence, civil strife and ultimately the erosion of all its power and prestige. This is the lesson of the French riots of May 1968.

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People who have a natural inclination to detect conspiracies influencing world affairs have advanced theories about a world-wide student revolt inspired indirectly by Mao's cultural revolution or other sources. There is nothing to substantiate such theories, but at the same time it is no mere coincidence that students in different places have protested about the same things in the same way. A certain amount of cross-fertilization takes place, as students are affected by the same issues--overstrained educational systems and lagging reforms, the war in Vietnam, the Third World and racial discrimination, interest in extraparliamentary opposition and in consensus politics. The ideas of Marcuse, Guevara, Debray, Goodman, Camus and Fanon are attractive to a wide audience. Some cross-fertilization may be deliberately organized, but most of it is naturally occurring. Exchange students bring ideas and teach methods of protest; leaders of student radical movements meet, exchange views and even organize demonstrations of mutual support. German SDS leader Karl-Dietrich Wolff spent a year in the United States with the civil rights movement, and German SDS students have influenced French (Daniel Cohn-Bendit) and British (David Adelstein) student activists. The Berkeley Movement was well scrutinized by European students. And mass communication has a powerful effect, helping students to keep up-to-date with the latest outbreaks elsewhere.

Students in many parts of the world have been concerned that the rising technocratic society is weighing upon intellectual freedom. They are also concerned with the real or imaginary activity of the CIA in particular and of U.S. interventionist policy in general; with the liberalism emerging in Eastern Europe while uncertain liberals in the West rediscover Marx; with the new social experiment in Cuba; with punitive police brutality in quelling demonstrations; with the tolerance of undemocratic regumes such as Greece by its allies; and with the coming revision of NATO. More locally, students have been concerned with such issues as the rise of racialism in Britain and the backlash as represented by Enoch Powell, the new emergency laws voted in Bonn and the pervasive power of the Springer Press; the curbing of freedom of expression and censorship of student publications in Spain, Poland and Yugoslavia.

The wretched state of the universities is undeniably a justified take-off point for the student protests. Antiquated facilities (France, Italy) and teaching methods are coupled with a generally lethargic bureaucracy, which gives students an unpleasant foretaste of the bureaucratic world at large awaiting them. While the yearly input into the student population is tremendous,* misgivings about the "rat race" in the outside world cause thousands of students who normally would have left the universities to remain on the inside as long as they can. The enemy--East and West--is the bureaucratic state and the affluent society, which perpetuates an educational system geared to produce docile technocrats. Powerful bureaucracies in Washington and Moscow, Paris and Bonn, Rome and Belgrade, Madrid and Cairo, are seen as brainwashing by manipulation of the press and TV, while offering a growing number of comforting material goods. Universities are distrusted not only because of their ossified structures, but also because they are a product and a part of a political system that is oppressive to the young. With Marcuse, students see a "repressive tolerance" pervading most countries and view liberalism as a dangerous sham concealing the most efficient controls known to society. They see science not as a wave of the future, but as having developed a power of its own, driving governments to develop space research, supersonic airlines and atomic equipment instead of spending on much needed housing, schools and education programs.

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*For charts on student population see Mark Wehle, "Notes on World-Wide School Enrollment and Illiteracy to the Year 2000," Part V of this report.

In Europe, the student rebels believe that parliamentary democracy is moribund and that political parties no longer represent the interests of the masses. They see the parties as simply launching pads for careerists and fail to find in them forums for discussion, because party leaders do not encourage dialogues with the rank-and-file. They deplore the manipulation at high levels and the lack of initiative from below. There seems to be no scope for fresh blood and bold ideas.

Cooperation among the various European student organizations has increased since a conference in Geneva in 1966. A meeting of European syndicalists in Brussels in March 1967 helped consolidate this cooperation, and a coordinating secretariat was set up in Amsterdam. Resolutions were passed for international action against the war in Vietnam and for militant student action generally. The Vietnam Solidarity Campaign, led in Britain by the Pakistan-born student leader Tariq Ali, helped bring a number of revolutionary student leaders together in London. The Communist-controlled International Union of Students (IUS) in Prague has been active in the student movement in Western Europe. French (UNEF), Belgian (VVS), Portuguese, Spanish, Canadian and Irish student organizations are affiliated with IUS.

The German Student Movement

The self-assurance of German society has been undermined by the emergence on the left of a radical "extraparliamentary opposition" which seeks change and reforms through a strategy of studied provocations of the establishment. The students protest against the academic system and a stagnant society. They have noted that professors and politicians have instituted quantitative changes (bigger scholarships, lecture halls, professorships) but have been unable to effect structural changes, such as breaking the monopoly of professors with tensure and giving students and junior staff members a voice in the administration. The stagnation of reform is interpreted by students as a confirmation that the system is self-perpetuating and incapable of basic changes.

The intermingling of grievances particular to students as such and general political issues is more complex in Germany than in other European countries. Anxiety about the future of the divided country is the basis for considerable restlessness, among both Germans and neighboring Poles and Czechs.

Students come predominantly from upper middle class families, with only 5 per cent from the working class, and Germany lags behind other Western countries in the proportion of young people in the universities. Many of these students appear determined to atone for the society of their parents by bringing about a change. In this drive, they try to reach out to the working class but fail to establish contact--the affluent society has made German workers more establishment-oriented than ever. The ideal of European unity which inspired quite a few students a decade ago has been substantially quelled by the Gaullist policy of firing nationalisms. And anti-liberalism remains an almost unbroken tradition among German student fraternities and "corporations" (although it is worth noting that these organizations have lately resisted the pressure of the extreme right).

Only 3 per cent of German students belong to any political organization, while 15 per cent belong to "corporations," but the democratic ideal has taken better root among the students than in other sectors of society.

Polls in early 1968 showed that only 4 per cent of the students thought Germany needs a strong-man ruler, compared with 25 per cent of the population at large. A nation-wide survey conducted by a professor at the University of Mannheim showed that 80 per cent of the students are opposed to dictatorship in any form, compared with 50 per cent of the non-student youth. Ninety-one per cent of the students said "no" when asked whether National Socialism had been a good idea only badly carried out, compared with 57 per cent of the non-student youth. Seventy-four per cent of the students approve of mass demonstrations to vent grievances, compared with 67 per cent of all people between 16 and 25 years. And 17 per cent of the students approve the use of force in political action, compared with 23 per cent of the young population. Student hostility to the "Grand Coalition" is explained by the belief expressed by 74 per cent of them that the function of opposition is not that of supporting the government, compared with only 32 per cent of non-student youth.

The political affiliation of the students is scant. The Social Democratic youth organization has about 1,500 members, the Christian Democrats about 1,000, and the SDS (Socialist Students' League) 2,500. An influential local organization is Berlin's Republican Club, with some 600 members, which was organized by less militant SDS leaders. Initially it was intended to operate as a forum for discussion with liberals in the established parties, providing an avenue for conciliation between them and the student radicals, but lately the Club has supported SDS actions outright.

Organized in 1948 by the Social Democratic Party, the SDS was at first a training ground for Socialist parliamentarians. When the SDP decided at the 1959 Bad Godesberg convention to jettison much of its doctrinaire Marxist baggage, the SDS refused to accept the decision. In 1961 it was expelled from the SDP and has been moving further left ever since. A former SDS chairman, Reimut Reiche, explained that the group's "minimal program is the maintenance of bourgeois democracy, our maximal condition the transformation of the capitalist countries into Socialist ones." Current leaders, such as Karl-Dietrich Wolff, his brother Frank, Wolfgang Lefevre and Rudi Dutschke, identify themselves as democrats advocating the creation of an extraparliamentary opposition aimed, according to Dutschke, toward a system of direct democracy, that is, a democracy of councils (patterned after workers' councils) which allows people to elect and vote out of office their temporary representatives as they deem necessary, on the basis of a critical consciousness in regard to any form of power.

The method to be used was a "long march" through all established institutions--schools and universities, factories, homes. Such a march to politicize other segments of the population is more feasible in Berlin than elsewhere because of the tense situation in that city, the superannuation of its population and its dependence on federal subsidies. The SDS also conducted a campaign with traveling exhibits to familiarize the public with the Nazi persecution of Jews.

The SDS is determined to act against the spirit of hierarchy which dominates in Germany--where the young scholar, waiting for promotion, is at the beck and call of his professor--and it has developed a plan for university reform that could serve as a model. The student leaders sometimes imagine themselves to be a persecuted minority in a "para-fascist system," a feeling reinforced by the vicious attacks upon them in the Springer Press. In a masochistic way, they follow a strategy of provocation leading to violence against them. They call themselves Germany's Jews today (Dutschke), and seem to identify more with the role of victim than radical reformers, exhibiting a certain amount of self-pity and irrational defensiveness. Of the 2,400 SDS members, some 400 are in Berlin. They believe they are the saviors of democracy in Germany and favor an independent line on Vietnam, East Germany and NATO. They deplore nationalism as a driving force and want the "direct democracy" of workers' and students' councils (Ratesystem). They identify with such underdog leftists heroes as Guevara, the Vietcong and the 1919 Spartacists, Rosa Luxemburg and Karl Liebknecht.

With reunification less a national issue among the young and with the lack of other issues, the action-oriented SDS had to bide its time, awaiting some incident that could be used to mobilize fellow students. The opportunity came on June 2, 1967, on the occasion of the visit of the Shah of Iran to Berlin. The police brutally dispersed a demonstration against the Shah and one student, called Benno Ohnesorg, was killed. He became a martyr of the student cause and his death triggered demonstrations against the police. An investigation led eventually to the resignation of the chief of police and undermined the prestige of former Mayor Albertz. The policeman accused of shooting Ohnesorg was later acquitted, and this was touted as an example of the way the courts administer "political justice." The SDS had the issue it needed, and one of its leaders, Wolfgang Lefevre, observed with satisfaction, "before June 2, 1967 there was not a grain of antiparliamentarianism in the student body. After June 2, the students grasped that the legislature works hand in hand with the executive." The Springer Press followed these events with an unparalleled campaign against the students. The students countered by attacking the Springer Press with pamphlets, speeches and demonstrations, which on occasion turned quite violent (February 1968). Events in Czechoslovakia had an effect on the students, who pointed out that in Prague an authoritarian government engaged in a dialogue with their counterparts, while in the Federal Republic the police are turned loose on those demonstrating for legitimate grievances.

In November 1967, the radicalization of students was channeled by the foundation of the Berlin "Critical University," patterned on the U.S. free universities. Of the 240 professors at the Berlin Free University, some 50 supported this Critical University. Included among its aims are:

1. Public enlightenment as to the political and economic situation of the student movement and the political and economic situation of Germany; and preparation for joint action with democratically minded workers and high school pupils.
2. A critical evaluation of Germany's attitude toward liberation movements in the Third World and their destruction by the American power elite.
3. Preparation to resist future emergency actions, abuse of the constitution and police brutality.
4. Training of cadres for an extraparliamentary, anti-authoritarian opposition.
5. Public hearings and a documentation center to expose the abuse of power and science for destructive purposes.
6. Seminars dealing with topics avoided by the universities. (Subjects included: Medicine Without Humanity, Sexuality & Domination, The Function of Intelligence & Science in the Vietnam War, The Cuban Model & The Future of Latin America.)

The students had another issue suitable for violent demonstrations in the attempted assassination of Rudi Dutschke on April 11. This was the first serious attempt at political murder since the war, and the young gunman turned out to have been a Nazi sympathizer. Students reacted with violence against the Springer plant, made bonfires of the papers and set in motion a plan to prevent the trucks from making deliveries. They blamed Springer for the climate of hostility against the students which, they said, led to the Dutschke shooting. Students attempted to force RIAS radio station to give them one hour of free time daily and seized parts of the Berlin Technical University. There they conducted round-the-clock discussion sessions on revolutionary themes--safe in this academic sanctuary, as the rector refused to call in the police. Better organized after these events, the students were able to march on Bonn to denounce the enactment of the "emergency laws" in May 1968.

These flare-ups led to some positive achievements. They helped strengthen need for university reforms and spread the concept of free universities. They helped attract public attention to the problems of monopolization of the mass media (Springer recently sold four of his papers), and more important they may have sparked a new spirit of dynamism within the SDP which could lead to the breakup of the Grand Coalition. It is interesting to note that one of the prominent student rebels has been Peter Brandt, the son of the Foreign Minister and SDP Chairman.

The French Student Movement

In France, the student movement was based on legitimate grievances over the heavily overcrowded universities and their backward facilities. Disenchantment with the paternalism of the Gaullists and their promised academic reforms, coupled with the aloofness of the professors and the emphasis often placed on irrelevant subjects, led students to consider revolutionary action. Most French students agree that the academic system must be changed. A university, besides providing adequate facilities for its students, should be engaged in a continuous critical dialogue with society. It should also be administered and organized by and for its members and not ruled autocratically from on high.

Part of the turmoil stems from the fact that the system was unprepared to handle the sudden increase in the size of the classes. From 170,000 students in 1958 there has been a jump to some 515,000 in 1968. The university administrations have traditionally been centralized and autocratic. In fact, the universities have been an appendage of the state, and professors state employees, with guaranteed security and pensions. There has been little professor-student contact and classroom discussion is almost nonexistent. Undue emphasis is placed on ruthless year-end exams, whose outcome determines a student's future in society.

On the surface, the French educational system is the basis for a meritocracy. The doors of the 23 universities are open to anyone who has completed the baccalaureat, which marks the end of 12 years of education (primary and secondary). Further competitive exams determine who gets into the grandes écoles, which open the way to a role in the establishment. (Only the top 10 per cent of the applicants make it.) A student from a working-class background would be able to pass his baccalaureat but he would be unlikely to be able to afford the time to take his aggregation, a selection exam for teachers which has become a passport to high office in the administration. To become a professor requires the successful endurance of a lengthy doctorat d'état. There are very few grants comparable to U.S. scholarships to allow talented students to pursue postgraduate work. The path of advancement in France is very slow.

There are no departments in the universities, only chairs, and with no department to guide his program, a professor is free to do as he pleases. Because each university faculty has its own dean, responsible to the Ministry of Education, university heads often cannot reprimand their staff.

Seminar-type courses are nearly nonexistent. Lectures are delivered ex cathedra to an overcrowded, unquestioning audience. Copies of these lectures, sometimes unchanged in over 20 years, are circulated in mimeographed form and studying for year-end exams means essentially the careful memori ation of these lectures. Research, original thought and extracurricular academic pursuits are sacrificed to the ability to make a coherent case subtly and plausibly out of a few relevant facts.

The dropout and failure rate for French universities may be as high as 70 per cent. Dean Marc Zamansky of the Paris Faculty of Science estimates that 50 per cent of science students drop out after two years. Of those who stay on, 50 per cent are helped by their families, 22 per cent have scholarships; 10 per cent have a state grant on condition they subsequently teach for five years. Thirty per cent in all are obliged to work for their support.

The government has been aware of the need for decentralization and construction of new universities. Four have been founded near Paris, in the past decade, the best known of which is in the suburb of Nanterre. It was supposed to provide comfortable quarters and modern facilities for students. As it stands, it resembles a lower income apartment block whose only facilities are a restaurant, a pool and an unfinished library. From

2,000 students at Nanterre's inauguration in 1964, the number jumped to about 12,000 in 1968. In November 1967, the sociology students organized a strike in protest against the way reforms in higher education were being introduced and demanded student-teacher committees to discuss them. They were backed by the younger professors. The strike lasted barely a week. The Ministry of Education promised improvements and by January 1968 additional staff came to Nanterre.

The Dean of the University at Nanterre, Pierre Grappin, worried about grumbling among his students, allowed police plainclothesmen on the campus. Students took steps to identify them by taking their pictures for the student bulletin boards. On January 26, the Dean, faced with continuing student sit-ins, called in uniformed police. In an ensuing battle, the police were repulsed by militant students, led by a group later dubbed by the press _Les Enragés_ (The Enraged Ones).

On March 22, Daniel Cohn-Bendit and a small group carried out a token occupation of the administrative offices. Out of these actions against the university administration grew the "Movement of 22 March," which came to play a major role in sparking the student revolution. On April 4, the Dean closed the university but had to rescind his order two days later. The situation on the campus slowly grew out of control, as moderate students rallied to the demands of the militants. The presence of police on the campus was the major factor in rallying students behind the militants. On May 2, fearing that a violent outbreak was imminent, the authorities closed the university and Cohn-Bendit and his friends were ordered before the University of Paris disciplinary committee, to face possible expulsion.

The next day, thousands of students in the Latin Quarter joined in a demonstration of solidarity with their comrades at Nanterre. The Sorbonne was a powder keg--grievances had rankled there long before Nanterre existed. In principle, the government was aware of most of these grievances an acted to implement some reform. The Fouchet Plan of 1966 (set up whe Gaullist Christian Fouchet was Minister of Education) was an attempt o "rationalize" the exam system and the departmental structures of the niversities. But it appears that the implementation of these reforms ws so complex that there was considerable disagreement among professors s to their application. Given the rapidly rising student population, te Minister of Education, Alain Peyrefitte, introduced the principle of election for candidates applying to universities in order to open the oors to the "best qualified." For generations the baccalaureat was sufficent to qualify a student for university studies. In changing the system o allow for "qualified" students, the new approach seemingly made it mre difficult for those coming from the working classes--who have a tough enough job getting their baccalaureat as it is--to qualify for further academic work. This presented an issue upon which students and workes could join in opposing the authorities.

While the Sorbonne students prepared to march in support of thei suspended comrades from Nanterre, right-wing youths of the militant organization, "Occident," gathered on May 3 to march against the Nantere students. "Occident" was reputed to have some of the best organized street militants in Paris. Rector Jean Roche of the Sorbonne feared bloody clash was in the offing, just a few days before the annual exas, which might set back the program of the entire student body. With th approval of Peyrefitte, Roche decided to close the Sorbonne and ask r police and the paramilitary CRS riot squads to clear the university extremists.

Closing the Sorbonne was almost unprecedented in French academic history (only the Nazis forced its closing once). The removal turned into a clumsy roundup. As students watched their extremist comrades packed into police vans, their sympathy turned to outright support against the police action. The fuse was lit. The police started the pattern of violence by attempting to clear the area by systematically arresting and beating students and innocent bystanders alike. The major student union, UNEF, and university teachers' union, SNESUP--the National Association of Higher Education--called their members out on strike on May 4. Neither group was militant, but their call provided a rallying point for discontented students and teachers. By May 6 the violence had escalated, reaching a peak complete with barricades and tear gas. The solidarity of the students increased with each day that passed. The protest strike received between 60 and 80 per cent support throughout Paris. Other universities joined the movement, as the moderate students fell behind the militant policy of UNEF. What started with a few hundred protesters on May 3 rose to 30,000 by May 7, when the 30,000 marchers demonstrated at the President's palace and at the offices of the conservative newspaper Figaro. This march was the first extension of the demonstrations to issues other than immediate university grievances. Teachers joined the movement, as did some workers, but the Communist Party and its powerful union ally, the CGT, were still dismissing the students as classroom revolutionaries inspired by Maoist and anarchistic "groupuscules" (minigroups). The Communists, with their traditional tight grip on organizations they influence, were leery of radicals such as Daniel Cohn-Bendit, who ascribed the strength of his movement on "precisely that it rests on uncontrollable spontaneity to which it gives elan without trying to canalize or utilize for its profit the action which it has unleashed." There were now several layers of demonstrators. First there were the "enraged ones" and their supporters--about 150 of them. Then were gathered some 2,500 militants from various leftist dissenting groups, many familiar with the principles of urban guerrilla warfare; 2,000 students belonging to UNEF; and a mass of 5,000-8,000 young people (many were high school students) who came out in the streets to show their solidarity. The demonstrators did not have any battle plan for confrontation with police, but they appeared to have a superior knowledge of the Latin Quarter terrain. They organized reconnaissance operations to watch police deployment, and spontaneously mounted rear-line squads which kept the barricades supplied with weapons and projectiles (stones, iron bars, pieces of furniture).

The total strength of the police was 2,400 men (including 200 from the CRS riot squad). They soon realized that the "armed" demonstrators were equal in numbers and had the advantage of terrain and the sympathy of most of the Latin Quarter. With a growing toll of injuries, the government momentarily dropped its resolve to crush the movement and withdrew the police behind a cordon in the area.

On May 7, the student union, UNEF, proposed a meeting with the big labor unions, CGT and CFDT, but the latter's response was unfavorable to a suggestion for united country-wide demonstrations.

The students were demanding release and amnesty for those arrested, the reopening of the Sorbonne and Nanterre, and the withdrawal of the police from university grounds. Rector Roche was willing to grant these concessions, but the acting Premier Louis Joxe (Pompidou was on a state visit to Iran and Afghanistan) wanted a showdown. It came on the night of Friday, May 10, as the CRS riot police stormed the barricades, using tear gas and a riot gas developed in the United States. The students held fast, and the following day the unions agreed to meet again with student leaders and to call for a general strike in solidarity on May 13.

Meanwhile, at the Sorbonne, the governing body of the university, with 118 full professors attending, was meeting on May 11 to act on demands of lecturers and students for sharing in the decision-making process of the university. They agreed by a vote of 65 to 53 to "democratize" the Sorbonne. A new governing body would give the professors 50 per cent of the voting power, the rest to be apportioned between the junior teaching staff and the students.

On May 12, Pompidou, returning to Paris, agreed to the student demands and ordered the reopening of the Sorbonne. But he was faced with fresh demands for the resignation of Interior Minister Fouchet and Police Chief Grimaud, held responsible for the violence and brutality of the night of May 10.

The general strike of May 13 came on the tenth anniversary of the fall of the 4th Republic. On the surface, the union leaders were satisfied with a one-day solidarity walkout, but somehow in a few days spontaneous workers' strikes struck various plants and industries. The crisis started by the revolting students had become country-wide. Eventually the students were outflanked by the workers.

French students have demonstrated how determined, direct action actually works in confronting a seemingly untouchable government. And they have succeeded in shaking up the "established order" in the universities. A return to the status quo is now out of the question. Professors and students alike now agree on two concepts--autonomy and joint management--but this does not solve the political problems raised by the rebellious students. For university reforms do not solve the political aspects of the crisis.

The majority of students are conservative and remain primarily concerned with getting their degrees. The May-June crisis showed, however, the degree to which a determined minority can stimulate the traditionally liberal academic environment. The student movement has found expression in attacking the very structure of the French social and political system. For these rebel students, it is no longer a matter of struggle against the Gaullist regime or a new version of the traditional left-right alternative. They question the whole system--including the parties and the unions, which in their eyes contribute along with employers and state bureaucrats to the general oppression exercised by society on individuals. When the Communists and the left agreed to de Gaulle's call for new elections, many cries of election-trahison (betrayal) were heard. By agreeing to play the electoral game, leftist parties have rallied to the social order whose final purpose, as the student rebels see it, is to prevent the free expression of individuals and of the masses and keep them in a state of "contented alienation."

Conclusion

History has seen several "cultural revolutions," expressing the frustrations and ambitions of young people, often associated with demographic pressures and changes in the structure of the society. They have usually ended in compromise, disappointment or outright repression, even though at the time they were necessary and even healthy, within their limits. The student movements have raised questions which are important for the future development of society. One should peer behind the cliches that enmesh student slogans and customs (references to Marcuse, Mao and Guevara; sit-ins; the folklore of rock and eccentric clothing), and consider the constructive criticism.

It is to be hoped that the current upheavals will fare better than previous historical examples, in the sense that they will ultimately help the post-modern generation to act constructively in our changing society. While it seems that initially leaders of all student movements share a deep pessimism about their chances of changing and influencing the technological society (and it may indeed be irreversible), they may ultimately have triggered forces for change. If so, the need to reconstruct anachronistic universities remains none the less great.